University of the Aegean
Department of Product and Systems Design Engineering

Interaction for Design: A theoretical framework for contextual collaboration

Ph.D Thesis

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To Sofia, light of my lifeworld.

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Part 1

Preliminaries: Theoretical Issues and Research Framework

1 Introduction

Our current *networked* era has been called the era of interaction, communication and collaboration or in other words the 'networked society' (Lehman, Qvortrup, & Walther, 2007).

In this thesis we investigate the conditions for the possibility of interaction, communication and collaboration in socio-technical contexts. Our purpose is not to 'design interactions with artefacts'[1], but to outline the state of affairs where networked communities of disparate individuals and artefacts come to realise within a process of interaction, communication and collaboration, and thus, self-organise within this very context of interactive activity.

There can hardly be any doubt that the conditions for describing the ways we interact and collaborate has changed over the past years. Today, we do not only network our communication and collaboration activities with other conscious beings alone, but also with devices, tools and technological systems that provide a radically different environment for understanding interaction and purposeful communication and collaboration. Evidently, revolution in sciences and information-technology had profoundly changed the ways we interact with our environment.

However, the question is whether this scientific, technological and social shift, is also changing the philosophical and methodological assumptions that we should make in understanding and organising our contexts of designing for interaction, communication and collaboration. For many reasons, today, we neither rely on the traditional positivism and the Cartesian separation of object and subject nor to the relativism of constructionism. Actual processes and events of reality are neither reducible to physiological, physical and chemical events nor to social processes which have been falsely represented as human actions. And we have large number of examples that provide evidence that systematicity led to great failures while relativism led to meta-narratives.

From a philosophical point of view, we see that intentionality ascribed to structures (either individuals or static systems of interaction) is to be abandoned and instead searched within the limits of their contextual interaction. Hence this thesis seeks for a systemic, ontological framework for understanding and approaching interaction,

[1] Today we no longer think of these notions in isolation or as synonymous with the technological apparatuses that support them, primarily because they came to influence the domains of the social and the cultural. Interaction, communication and collaboration are considered as 'processes' that take place among networked groups, artefacts and systems (technological or social).

communication and collaboration processes, which is able to describe the ways we organise in networked societal groups or contexts of interactive participation, within a context of psychological, social, and material relations. The purpose is to move towards this kind of study and thus reflect upon the consequences of philosophical and methodological understanding for designing and organising for interaction, communication and collaboration.

Theory and practice in these themes has often, from modern to postmodern traditions, been conceptualised in opposition and therefore provided the grounds for the development of grand-narratives or overarching theories of everything. However, in these traditions we find the most intriguing philosophical concepts for understanding and explaining our current fragmented chaotic, multi-paradigm era. Here we find it necessary to (de)construct the hiatus between the modern and the postmodern and thus explore it through the prism of a pluralistic multi-methodological framework that attempts to provide a smooth transition from dualism to a unified non-contradictory understanding of the processes of collective interfacing. This thesis attempts to become a wide-ranging investigation that explores the foundations of contemporary thought. In the course of this exploration, we put into question a number of dimensions on the frontiers of the human intellect. These include ontology and epistemology, phenomenology and hermeneutics, the origin of language and the various modes of its development, intelligence in the human and the social, recursion and self-reference, complex systems and psychoanalysis among others. Our reflections come together around a centring insight into the dynamic nature of the individual and its relationship to consciousness and to the processes of intersubjective interaction and the social. According to these lines of inquiry, the subjective mind is not our centre. The subjective factor, though important, is neither an 'object' as it happens in empiricism, nor the sovereign and fully-autonomous subject of rationalism. Instead by interacting with the material and the social dimensions it forms as a process, an animated event that vigorously oscillates as a boundary incident that is responsible for producing the primary "*difference that makes a difference*", an opening distinction from which all other distinctions evolve (Bateson, 1987). Interaction, communication and collaboration are therefore processes that occur within contexts of mutual participation of animate and inanimate entities that effect upon one another and thus self-develop within a network of reciprocal relations. This type of explanation relates the concepts with a purposeful behaviour and assumes as important the issues of interconnectivity and interdependence. This type of inquiry disavows the deterministic on-way causal act of explanation and focuses in interconnectivity and emergent combination of actions. This understanding of 'interaction processes' as 'inter-connectedness' (a state of being connected and the relation between entities with processes and events) is an idea that refers to a number of different intellectual domains including communication studies, cybernetics, sociology, computing, systems theory among others. The concept can be summarised as the phenomenon where relations emerge among participants and between them and the networked context they develop. It

also includes the purposeful anticipatory character of design, organisation and creativity and an effort towards evolution through stabilisation, change and creative use of heterogeneity. Interaction, therefore, is to be thought as a moral, social and physical phenomenon or an event that never ceases to exists, as far as, we engage in a world of continual change.

1.1 Structure of the thesis

The structure of this thesis uses a reasonably traditional research paper style but is necessary to be considered a postmodern text as it is written from the belief that any position is put in place and held there only through effort. The latent scope of this effort is to continually displace fixed meanings and introduce a plurality of voices by refusing a conclusion of its own claim. This thesis is to be conceived as a "writerly text" where the readers are also responsible in deciding the ending, contrary to the traditional style where the reader must come to the writer's conclusions. This thesis makes a great effort to respond to a number of related issues to its main theme and thus proposes ways to 'diverge' as well as to 'converge' towards knowledge inquiry in terms of philosophical, methodological and practical means. Its aim though is to offer no final answers but only several possibilities for extension. Any conclusions are to be considered as open themes to further improvisation. The works gathered in this thesis represent precisely an interdisciplinary effort to explore the role that '*systemic interactive processes'* play in forming our fundamental beliefs and values, not only with regard to communication, collaboration and technology, but still more fundamentally towards such basic values as those that cluster about our preferences for democratic, individual autonomy, technological change etc. They do so through the lenses of the following disciplines:

Philosophy: as, among other things, an effort to articulate and critically evaluate fundamental assumptions, including the assumptions regarding values (discursive practices in terms of morality and ethics), reality (as restricted to the material or not), knowledge (what counts as legitimate knowledge and how legitimate knowledge(s) may be acquired), and identity (including assumptions about human nature, self etc.) that define the worldviews definitive of diverse cultures;
Communication theory: including communication as considered in a variety of philosophical, scientific, political and sociological contexts
Design, creativity and interaction processes that emerge within contexts or networks of participation.

This thesis is written for design, communication, cooperation, coordination and collaboration theorists and practitioners. It is divided in the following major sections:

Part 1: Sections 2 to 4 build a review of the current epistemological background. Knowledge production, understanding of the ontological and the real are considered

and analysed. It also deals with the issues of communication, collaboration, design and creativity that play important role in contextualising interactive activities.

Part 2: Sections 5 to 8 offer a thorough analysis of the proposed theoretical framework of interactive participation that attempts to break with traditional ideas of knowledge production and the understanding of the real. Also it builds the pluralistic methodological account that attempts to ground the theoretical arguments made previously.

1.2 Thesis Contribution

Interaction, communication, and collaboration are subjects of research in many diverse and disparate fields while exists no consolidated theory that provides a pluralistic languaging framework for understanding the aspects interactive collaborative practice. There, also, does not exist a complete body of knowledge or an ontological framework to support both the theoretical and methodological levels for those dealing with interactive collaborative practice in design-based contexts.

The research done in this thesis tries to bring together theories from a disparate field of knowledge in order to provide a theoretical framework which tries to deepen our understanding about the current tenets of interaction and collaborative practice. Hence, this thesis aims to contribute to the development of a multi-methodological framework of collaboration and for the analysis and design of collaborative contexts. Thus, it refers to the philosophical, methodological and practical aspects of the argument at hand and tries to address a number of related issues, including: The philosophical assumptions of the modern and postmodern paradigms, the meaning of communication and collaboration, the auspices under which interactive activity is concerned, the role of intervention in directing social change, creativity and design, the implications of interaction and collaboration for environmental complexity and organisational control.

This thesis formulates a new approach for bridging the philosophical gap between modern and postmodern theories of understanding reality, knowledge, and social practice in the context human collaboration and communication. The contribution of this thesis is threefold: it provides a thorough overview of the most important philosophical issues regarding interaction, communication, and collaboration in socio-technical contexts, it formulates a theoretical ontological framework for understanding interaction, and finally it generates a pluralistic multi-methodological device for explaining intervention from within the context of analysis. Together these three directions presented the authors with an immense research agenda that involved the transformation of ‘theories of everything’ to a theoretical ontological pluralism.

2 Examination of Theoretical Issues

This chapter provides an examination of the theoretical and philosophical issues that informed the constitution of the theoretical and critical views presented in this thesis. It departs from a historical analysis of the epistemic processes and the traditionalistic understanding of epistemic unity and concludes to the recent transformation that governed nearly all scholarship[2]. The purpose of this chapter is not to suppress or silence opposing voices of dissent, but to provide an insightful investigation of knowledge claims over a wide range of disciplines. Therefore, it provides a thorough analysis of the philosophical, scientific, critical and cultural aspects of theory-building and tries to give explanations and to relate essential epistemological questions towards an exploration of the impact of the philosophy of knowledge on society. In extent provides a justification to the way communicative and collaborative practices take place in epistemological contexts and how these influence collaborative-systems design and development, especially in design settings where material and technology mediated processes are considered important.

In order to provide a thorough analysis of the aforementioned issues of theory-building in terms of communication, collaboration, and design it is important to note that a theory, despite the possibility of its falsifiability, is not simply evaluated in terms of its legitimate all-encompassing metaphysical truth, but rather for its ability to give enough evidence for the plausibility of events within socio-cultural contexts (Littlejohn, 2007). Especially within scientific domains where psychological and social interests are involved, we may find several different theories from different paradigms that each describes phenomenal issues in informative ways. We consider important to be able to use such theoretical views as vehicles for the communicative and collaborative construction of our own communicative practices and reality. Our purpose is to describe theories of social communication and collaboration, meaning and its communicative practices, as processes through which we understand the world - being-in-the-world[3] - together with other scholars - being-with-others[4] for the purposes of making intentional change -design.

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[2] This transformation is considered to take place in terms of the Foucauldian archaeology, Kuhnian scientific revolutions, Derridean deconstruction, Lacanian Psychoanalysis of desire and jouissance, Peircean semiotics, hermeneutics, (meta)phenomenological approaches and other epistemic discourses, all of which focus on a construction of knowledge and reality.

[3] Being-in-the-world here is understood in the Heideggerian conception and is substitute notion for terms such as *subject*, *object*, *consciousness*, and *world*. According to the meaning that he attempted to provide, building upon the Husserlian paradigm, the dichotomous split of object and subject must be overcome. Heidegger places the observing consciousness within the observed system and thus 'consciousness is consciousness of/about something' and therefore

The theoretical positions in communication, collaboration and design are not considered unified theoretical domains/structures but fields of inquiry. This theoretical variegation makes it difficult to come to terms with the fields as a whole. Communication, collaboration and design are slippery concepts and approaching them requires a deep understanding of how theory is constructed. Thus, in order to afford such an epistemological context of communication, collaboration and design, that intents to construct an new way of methodological thinking and in extent to inform collaborative-systems design in terms of social communication[5] and information technology, this chapter departs from an analysis along a set of philosophic issues related to theory production and understanding.

These issues include, *Ontology* (or existence), *Epistemology* (or knowledge), *Praxeology* (or knowledge practices), *Axiology* (or ethical considerations, or value) (Seni & Hodges, 1996)(E. A. Griffin, 2002)(Littlejohn, 2007)(K. Miller, 2005). Arguably the representations of these issues are historically results of weak dichotomies (Anderson, 1996), therefore we suggest a move beyond the simple use of binary-opposing concepts of philosophical reflection and in their place propose a reflexive set of discourses that embody different assumptions about the relationships among them {see §0} and complementarily among the apparent arguments of this thesis: a theoretical framework for *describing creativity and collaboration in design contexts and its supplementary practical framework for collaborative-systems design*.

The aforementioned philosophic issues and the concerns that arise because of their engagement are used heuristically to sort through the complex of ideas and information that form the preliminaries of theory development. Accordingly we characterise as *Ontology* (of a theory or reality) the identified features (of a theory or the nature of reality[6]) which formally specify a conceptualisation of a field of knowledge or a way of understanding reality. Usually we relate ontology to the understandings of 1) the nature of the (phenomenal[7]) world, 2) the means of engagement with the (phenomenal) world and 3) the nature of the participants that

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there is no consciousness, *in-itself*, independent from an object. Accordingly, no objects exist in for humans without some consciousness beholding or being involved with them (Dreyfus, 1990).

[4] Following the Heideggerian notions where Dasein (existence) "that entity in its being which we know as human life; this entity in the specificity of its being, the entity that we each ourselves are, which each of us finds in the fundamental assertion: I am.", is conceived as being-in-the world or relations of Dasein to other entities and being-with-others or Dasein's uncertain condition of the "I am" and its indispensable relation to others (Heidegger, 1985; Heidegger & Maly, 2000).

[5] The field of communication study is remarkably inclusionary, and integrates theoretical perspectives originally developed in a range of other disciplines.

[6] Formally we ask "what is real?"

[7] "Phenomenal", in the sense of being able to be observed as an occurrence; either assuming an independently existing or purely empirical world.

interact with that world. In the event that ontology is grounded to a model or a specification of a conceptualisation, it formally describes concepts and the relationships that are believed to exist among them. In scientific domains than involve the dimension of the social, ontology deals largely with the nature of human existence. In communication and collaboration, ontology centres on the nature of human social interaction because the way the observing theorist understands interaction depends mainly on how the participating actor (communicator, collaborator) is viewed (Bowers & Bradac, 1982). Nowadays, ontology is closely associated to epistemology because the knowing subject and the nature of the knowing are interrelated. *Epistemology* or the philosophy of knowledge, claims understanding about knowledge construction and consequently tries to identify the character of the justified argument and the relationship between theory and method. In other words epistemology specifies what constitutes appropriate knowledge in a field, where it can be found and how it can be represented and transferred or disseminated. Known epistemological practices of the past include: empiricism (the investigation of the nature of physical reality), rationalism (the investigation of the nature reality in terms of mental processes), mysticism (the investigation of the nature of the real in terms of intuitionism), pragmatism (the investigation of the nature of the real in terms of interaction with ontological entities and their consequent practicality in everyday use) and constructivism/constructionism. The *Praxeological issues* specify the appropriate rules for inquiry[8] and argue about the ways theoretical concepts are put into practice. In praxeology the importance relies on quantoid or qualoid methods of inquiry, a binary opposition that for many disguise an ancient claim of the dichotomy of empirical over conceptual accuracy, or in other words, whether claims are to be fixed in perceptual observations or analytical ideas (empiricism versus idealism). *Axiology* defines a value system[9] in the field and focuses in describing the (often ethical or utilitarian) significance of it. It deals with the constraints that govern rational choice of purposeful activity e.g., predictive success, empirical adequacy, truth. In terms of scientific discovery its is considered as a supplementary notion to normative naturalism in that it offers means to choose among aims that scientific methodology should strive to achieve (Laudan, 1996). Axiology is often expressed by a split of value-free and value-intended action and is based on the historical dichotomy of objectivism versus subjectivism where in the former knowledge/reality is objectively described by neutral statements of “what is”

[8] Praxeology is the study of practices and actions. In general it asks “How it is done?” and therefore is a means of knowing.

[9] Axiology asks “What is the value of …?”

while in the later knowledge/reality is represented by an anticipation of "what it ought to be".

These four philosophical issues of ontology, epistemology, praxeology and axiology, perpetually co-evolve within an endless exchange of symbolic interactions. Epistemological positions permit the interpretation of ontological structures as well as the construction and modification of praxeological and axiological arguments. These in turn drive epistemological activity and provide a standard for the evaluation of the product of epistemological activity. Inescapably, ontological realities are re-examined in terms of their practices and values.

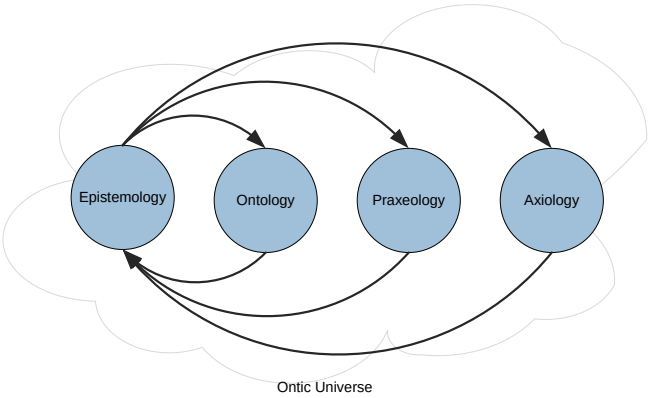

FIGURE 2-1 - ONTOLOGY, EPISTEMOLOGY, PRAXEOLOGY, AXIOLOGY

In contemporary philosophy, ontology, epistemology, praxeology and axiology are considered incomplete, fragmented and particular rather than universal {see §3.2.6}. What we support in this thesis is our contemporary view of these notions where their fusion constructs and exists in and due to an ever elusive, 'inaccessible' ontic (ontical)[10] universe [Figure 2-1]. In our approach what is considered important is the anticipation of an inaccessible real and the consequent replacement of logocentric methodological beliefs of modernism / structuralism and radical postmodernism / post-structuralism by recursive, self-referential, ontologically *proprioceptive* and spontaneous quasi-representational occurrences of (de)constructing[11]. This (de)constructing is considered in terms of a disavowal of the purity of structuralistic

[10] Frequently described as a Being of what is possibly there independently of any ascribed natural or ontological properties. The ontological being is often considered relatively to the ontical being, in a variety of paradoxical and conservative ways (Heidegger, 1962, 1988){Heidegger's Translators Macquarrie & Robinson explicitly define Ontological as the inquiry concerned primarily with Being while ontical inquiry is primarily concerned with entities and facts about them}(Derrida, 1969)(Bhaskar, 1986)(Levinas, 1996)(Feenberg, 2000). The ultimate issue that concerns the hiatus of ontic and ontological, is that since the ontological veils itself in the ontic, how are we supposed to get to the ontological? (Heidegger, 1962)(Zizek, 2000).

[11] For a more detailed analysis of (de)construction {see §5.3}

binarism[12] and its concrete margins, but also disavowal of the perpetually relativistic in-betweening of radical postmodernism (Bateson, 1979)(Derrida, 1976)(Rosen, 2003)(Neuman, 2004); (de)constructive by means of a proprioceptive process of Being {see §5.3.1) formation: of action and reflection upon action and its collateral products (artefacts, ideas and self). In the sections to follow, we try to provide a thorough analysis of these philosophic issues by exploring the historical positions that arose before and during their development.

2.1 Motivation

Based on the aforesaid issues of theory conception, progressive development and evaluation, in this chapter we introduce an archaeological analysis towards our own epistemological beliefs and the ways we approximate knowledge construction. Following the destruction of traditional epistemology and the consequent shift towards a discursive model of theory understanding, our motivation to theory building arises from the inexorable demand of evaluating epistemological certainty; or in other words “How do we know what we know?”

A common answer to this question, for a long time, has been found on a traditionalistic understanding of epistemology, evident in the face of the joint operation of Baconian empiricism and Cartesian rationality – Baconian in terms of an underpinning empiricism of incorruptible evidence to claim and Cartesian in terms a necessary rationality as a correctable method of applying that evidence to a conclusion- and the complementation of the successes of Newtonian and Darwinian scientific beliefs of the 19th and early to mid 20th centuries. The consequent decline of these insights in the mid and late 20th century was mainly a result of the non-conformity of the mechanistic (e.g., Newtonian) ideas when compared with the epistemological views of the human sciences that flourished at that time. The reliability of empirical experience was undermined because of the evolving studies related to human and/or social phenomena like perception/cognition, culture and language. The observational evidence, incapable to provide strong proof of its claims, was shown to be corrupted by the very nature of the established theories. In this sense, theory, seemed to better be explained from ‘higher level’ socio-contextual practices of epistemology, rather than the evidentiary methods of the traditionalistic science that were shown to provide promiscuous and fragmented evidence rather than faithful proof.

[12] a mode of thought predicated on stable oppositions (as good and evil or male and female) that is seen in post-structuralist analysis as an inadequate approach to areas of difference

At present, theory is better described by the certitude that is provided by a discursive activity within an actionalistic context. Theory acceptance and establishment is a *discursive act* or an act of '*political indoctrination'* while theory texts are considered polysemic ideological documents rather than comprehensive canonical facts (Wittgenstein, 1981) (Derrida, 2001). So the aim is that this text will provide a self-(de)constructing way of seeing science similar to meta-phenomenological approach of abstraction, concretion and self-deconstruction of a text (Rosen, 2003). Characteristically Rosen mentions that :

> *"[theory development] ranges from the heights of philosophical abstraction to the depths of concreteness. …there is a clear cut functional relationship between abstraction and analysis, which involves 'a breaking-up'. In both cases the basic procedure is that of division, with division becoming fragmentation in the end. In fact, the analytic work of 'pure science' can be taken as a prime instance of abstract functioning… to be ruled by science then is to be ruled by abstraction. And what the self-deconstruction of science must do is question that rule from within. Where does an effective questioning of abstraction begin? In its most concrete manifestation, I suggest. In writing about the abstractions of science and philosophy, the most immediate fact is that this text itself is abstract. The rule of abstraction clearly is in evidence right here in which we are communicating. … This means that, for self –deconstruction to be enacted in this text, the text must deconstruct itself. Not only must the abstractions of science and philosophy per se be questioned but also, our way of communicating about them, since that too is ruled by abstraction. To get beyond the abstract mode of functioning that we are involved in to a more concrete one, to reknit that which was torn asunder, we must move into and through our abstractness". (Rosen, 2004)*

In this leitmotif of presentation, what is needed is to confront the problems of foundationalism[13] posed by radical structuralism/modernism as well as the trickiness of radical postmodern/post-structuralist fragmentation and consequently to provide a middle way of approaching science. This requires a reflexive examination of the very means of communicative engagement in which we, as researchers, are currently involved. So to speak, the aim of this thesis is twofold, first to review theory and to provide a theoretical framework that is to question scientific approaches of collaboration and collaborative-systems design from within science, and secondly to

[13] The epistemic approach that holds that knowledge must be built upon certain irreducible claims.

supplement this theoretical position by providing a concrete manifestation of its own presence on the basis of extending contemporary beliefs about science in terms of a hands-on examination.

2.2 Methods of Argumentation: Normalising Theoretical (Con)texts[14]

Without forgetting the profoundness, the capacity and the range of the Enlightenment's battle against the supervenient mystical powers of the past and religion's wisdom, we should not be at all shocked that a different kind of freedom would develop as part of the paradigmatic shift of our days, and it did in the age of modern and postmodern thinking. This was found on the individual's right to autonomously discover the truth of his/her lifeworld without the need of approval from an absolute divine permission and/or transcendent regulations or intervention. Within the philosophical tradition of our days, there is an (unusually) broad consensus, that a theoretical position cannot be read (and become meaningful) except from a position close to the general framework of a related epistemic context. This belief/process of *backgrounding,* within the paradigmatic boundaries of an epistemic context, supports the idea that knowledge is domain specific or at least that it is normalised only within the limits of these boundaries. In order for someone to sensibly read/observe such (con)texts, is considered necessary to appropriate the same background assumptions of the original author. But is this the case? Knowledge might be viewed within the limits of an epistemic domain, but what about the identity of the domain itself? Are the domain boundaries concrete enough to provide us with an always stable ground? In other words, are they ever evidently contingent? Moreover, is the original author always cohesively informed and fully aware of the associations and implications of his readings and writings?

Complementarily to backgrounding, but from an opposite ideological direction, diversification (poaching or excorporation[15]) focus in making use of diverse, even conflicting theoretical positions, in order to support a particular claim. The process involves stripping of the term/notion/position from its collective ownership and while the latter is echoing past service it is put onto radical and even subversive uses (Anderson, 1996). These two methods of normalising epistemological (con)texts is very similar to the notions of *divergence* and *convergence* (often terms as

[14] Texts or contexts or (con)texts here are constructed settings in the Derridean sense {see §5.2.2}. According to the classical - metaphysical - views everything can be either a representation (representament, signifier) or a reality (real, signified etc.). When Derrida speaks of text he does not speak in the standard sense but with a twist. This (con)text does not curry the outside real, where things just are. Therefore there is 'nothing outside text', because there is nothing prior to the (con)textuality, no pure representation. (Con)text is not to be considered the ersatz or an imitation of a presence but instead an effect of its own (con)textuality (Lucy, 2003, pp. 142-144). What in structuralist semiotics is a *referent* or a (con)text in Derridean deconstruction is a referent to another referent, a (con)text that defines and is defined by other (con)texts.

[15] Within the semiotic, media studies and popular culture domains, many (Fiske, 2003) have coined the term "excorporation" - the antithesis of the Frankfurt School's "incorporation" - to identify the way in which subordinate groups take the products of the culture industries, turn them against their producers, and use them in a resisting discourse.

divergent/imaginative and convergent/factual thinking) used in describing creativity and decision making (Guilford, 1967, 1977). In this sense backgrounding and diversification, in terms of theoretical argumentation, may appear to be faults in a truth-seeking system - where the first imposes an objectification of theoretical constructs while the latter problematises them *while hiding its own* - but they are simply considered ways by which arguments can be normalised.

In the late 20th century the postmodern notion of *bricolage* that is often used to denote: "make creative and resourceful use of whatever means are to hand (regardless of their original purpose)" (Levi-Strauss, 1966) comes in contrast to the traditionalistic scientific process and theory construction. Bricolage sees theory development as a contingent process between constraints, influences and adversities of the cultural environment of scholarship in struggle with creators' idiosyncrasies. Derrida argues:

> *"There is therefore a critique of language in the form of bricolage, and it has even been possible to say that bricolage is the critical language itself … If one calls bricolage the necessity of borrowing one's concept from the text of a heritage which is more or less coherent or ruined, it must be said that every discourse is bricoleur" (Derrida, 1970, 2001),*

Gilles Deleuze and Félix Guattari, identify bricolage as the characteristic mode of production of a "schizophrenic producer" (Deleuze & Guattari, 1972), a producer that is at constant self-differentiation.

A further development that can be seen in the late 20th century and in terms of normalising theoretical constructs is evident in the post-structuralist, deconstructive, constructivist approach of Derrida's deconstruction were the very own and appropriated constructs/concepts of the theory that inhabits the site of argument, are put into question (Derrida, 2004). In his formulation Derrida reflects upon the current political and institutional conditions of philosophy questioning the growing tendency to orient research and theory formation towards programmable ends. Deconstruction proposes a theoretical model that provides new form of inquiry. A self-reflexive "mechanism" of decentring its own belief, in favour of a never-ending relativised model of theory production that gives more space to (self)diversification rather than backgrounding.

Derrida's famously most misrepresented[16] assertion in contemporary philosophy: *"There is nothing outside the text"*[17] (Derrida, 1976, p. 158) shows that there are no cultural practices that are not defined by frameworks that are "caught up in conflicting networks of power, violence and domination" (P. Baker, 1995). Characteristically he states:

> *"there is no outside-the-text' signifies that one never accedes to a text without some relation to its contextual opening and that a context is not made up only of what is so trivially called a text, that is, the words of a book or the more or less biodegradable paper document in a library. If one does not understand this initial transformation of the concepts of text ...[and] ... context, one understands nothing about nothing of .... deconstruction ..." (Derrida & Kamuf, 1989)*

The same is proposed by Deleuze and his notion of deterritorialisation which is regarded it as a transversal process that defines the creativity of an assemblage: a nonlinear and non-filiative system of relations. Uexküll also proposed that there is no meaning outside of a milieu or Umwelt (Uexküll, 1982). [18]

In contrast to the positivist project, where theoretical/philosophical knowledge can be objectively read and/or communicated, the contemporary posture of scholarship is inherent in a dialectical system of knowledge production where there is nothing that is not caught in a network of differences and references that give a (con)textual structure to what we can know. But since this (con)textual foundation is multiple, heterogeneous and fluid, its participants cannot fix on a solitary meaning for it; all such attempts to decipher its meaning presuppose an act of interpretation, an operation of construal, ceaseless multiplication of significations. Such a signifying chain is never ending, thus meaning is not to be seen as ultimately existent and consequently discovered, but perpetually and spontaneously produced within the *flexible boundaries* of an ever redefined (con)text.

Theory, then, describes a process and is described as a process, rather as construct, inextricably intertwined with (un)conventional methods of justification, practicing

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[16] In his text Positions (Derrida, 1982), Derrida reverses (and possibly, some might support, rejects) the *idealistic* meaning that is commonly accepted for this epigram. But it is evident from earlier texts that what he means is "There is no meaning outside of context, but no context permits saturation"(Derrida, 1970). For him there is an infinite number of contexts for any utterance while this reiteration found in any discourse is possible because the code underlying convention is always deceitful and/or latent, hence meaning can only be seen as undecidable.

[17] Or more accurately, "there is no outside-the-text" (Derrida & Kamuf, 1989)

[18] In his theory of meaning he supports that all signs used by living organisms are organised into an integrated system the Umwelt. This semiotic Umwelt-theory of Uexküll contradicts to the traditional positivistic methodology of science.

(in)dividuals[19] with (dis)continuous beliefs and desires, and (a)typical socio-cultural performances within polysemic (con)texts. In order to "normalise" such (con)texts and perform within the contemporary scholarship, we need to act on the razor's edge. Normalisation of theoretical constructs, as such, presupposes that theory formation is a messy process of continuous differentiations, of dogmas in an ongoing struggle to suppress and to gain mastery over the undeconstructible nature of possibility and uncertainty. Thus, we cannot rely on a process of signification of infinite regression where the acceptance of the uncertainty is the rule, nor that dogmatism of the stable/unitary event is the absolute solution. Argumentation upon such philosophical problems of theory formation is an activity of decisive significance and for these reasons a comprehensive framework of philosophical inquiry is need.

2.2.1 Thinking in Paradigms

At the beginning of the 20th century Carnap, Neurath and the Viennese positivists as well as the Berlin School of logical empiricists, all sought to overcome the well accepted situation of heterogeneity and fragmentation that was evidently hunting science and the German tradition to philosophy. Ironically enough[20], their 1962 edition of "*The Foundations of the Unity of Science: Toward an International Encyclopaedia of Unified Science*" (Neurath, Carnap, & Morris, 1971) included a text about the notion of paradigms in science. In this tractate, Kuhn in developing a concept of '*normal science*', argued that the evidence on progress in the physicalist[21] understanding of science - including the works of synthesis of Newton and the later work of Einstein - did not fit with the inductivist or falsificationist[22] (Popper, 1974) views of science[23] (Kuhn, 1962). Besides a scientific understanding, where science "*is revealed"* to the expert scientists throughout a process of reflexion-upon-action, Kuhn addressed the notion of science as developing through political tensions being resolved in the scientific community. He described the process as a sequence of successive developments, similar to the Derridean supplementation of both addition and replacement (Derrida, 1976) {see §5.2.2), which begins with the challenge of its

[19] Individuals are considered both as dividuals and individuals following the Simon Critchley's conception of the subject (Critchley, 2007) {see §5.3.2}.

[20] In opposition to the theme of the encyclopaedia, towards a unified scientific model, Thomas Kuhn's work is seen by many as offering a defence of non-unified science, although this is not to be taken as a conclusive fact.

[21] Physicalism is the metaphysical position that the universe is explicable in terms of the components of matter and energy that it contains. It is considered by many a more comprehensive term than materialism because it includes energy as well as matter. Both terms are usually contrasted with idealism, or any form of dualism.

[22] Where knowledge is considered valid if it can be falsified otherwise is pure metaphysics.

[23] Kuhn was a polemic to Popper and argued against the dualistic falsifiability principle.

own infancy, then resistance from the powerful, the death of the powerful, their replacement by the ageing young who then come to dominate, and finally the challenge yet again of a new reincarnation. In this sense, '*normal science*' and '*revolutionary science*' are profoundly intertwined in a recurring relational process of development and decay. Science in this respect is not described by an undeviating process of falsifiable hypotheses, but instead it is addressed through a series of irregular and sporadic periods of supposed '*normal science*' and revolutionary differentiations. Equal to the Foucauldian conception of *épistémè,* Kuhnian paradigms do not describe established ways of seeing the world (of knowledge), but instead fragmented structures (of knowledge or community agendas) fluctuating by disturbances of thought. In a similar understanding to Derrida, Kuhn conceived that there are several different ways of *'reading'*[24] primary scientific texts and he supported that the weakest of them is the one that seems more obvious to a contemporary reader. The old ways of thinking are so different to the new conceptions of knowledge that report themselves incompatible and incommensurable to the new. This incommensurability or untranslatability of the Kuhnian notion of paradigm in its later refined appearances did not preclude communication across disciplines but rather argued that understanding across the barriers could not be ruled out (Sankey, 2004; G. R. Weaver & Gioia, 1994). Arguably, the subject of the incommensurability of paradigms resides at the centre of the continuing issues of significance, existence and potential involvement of a number of contemporary '*paradigmatic domains or Kuhnian disciplinary matrices and exemplars*[25]' including, as we will see in the following chapters, epistemological paradigms {see §0}, sociological and organisational paradigms of communication, participation, collaboration {see §4}, creativity and design {see §6} and finally systems design[26] {see §5.3.3}.

Thus, a paradigm surpasses mere interpretation and can only be perceived in the context of a hermeneutical cycle within a putative structure of paradigms, where language and epistemological presuppositions are seen in parallel (Kuhn, 1974). In examining the construction of facts of scientific reasoning, important is the analysis of the microprocesses by which 'facticity' is observed, analysed and constructed; especially by looking at its paradoxical ontological nature. According to many researchers there arises a major problem "*from our contention that scientific activity comprises the construction and sustenance of fictional accounts which are sometimes*

[24] Kuhn mentions that this idea of incommensurable readings, came from his own understanding of the Aristotelian physics in comparison to subsequent philosophers' like Copernicus, Newton etc. (Kuhn, 1962)

[25] This is what Kuhn later called disciplinary matrix, supported by the notion of exemplar.

[26] In this thesis we focus on interactive, collaborative systems design, by taking a social-technical oriented approach for their design and understanding.

transformed into stabilised objects"(Latour & Woolgar, 1986, p. 235). They propose that we should re-examine, in terms of a sociological framework of science, the status of our constructed account of reasoning and the ways we produce normative structures of philosophical and scientific activities.

This antithesis to logical positivism, represented by the Kuhnian revolutions and its consequent epistemic traditions that emerged within our contemporary scholarship, supports that:

[1] The History of Scientific Revolutions is the most important concept of epistemology. The philosophical studies and their consequent rational explanations should always be evaluated in terms of concurrent datum.
[2] Central to epistemology is its dynamic development and transformation.
[3] The progress of science is a discontinuous, sequential and subversive, process of continuous reversals.
[4] Science is a human construct that exists within socio-cultural contexts similar to religion, art, politics etc. In this sense, science is always in a state of interaction with other areas/constructs of social life which greatly influences its existence and development.
[5] Epistemology is not to be considered a single scientific domain, but an all-inclusive network of coexisting theoretical, methodological, meta-theoretical, and practical doctrines. All 'intra'-scientific structures, including terminology, methods, and facts, are defined in terms of their concurrent "dominant" paradigm and their authoritative position within it.
[6] A paradigmatic shift is followed by change in the meaning of scientific terminology, causing disturbances in the relationships of different coexisting paradigmatic domains. This shift in language makes evident that there is no objective way comparing different paradigmatic domains. The possibility of a fully recovered communication among scientific communities of different domains is improbable because their incommensurable theoretical backgrounds are also incomparable.
[7] The new conception of epistemology that follows the era of Kuhn's scientific revolutions, considers objective truth as obsolete and the traditionalistic scientific advancement problematic in terms of its teleological purposes.

Following a (post)-structuralist approach of mediating between (and beyond) a modernist/structuralist and postmodernist/post-structuralist model of thought {see §5.2} we infer that paradigms are, in part, socio-developmental and actionalistic by nature. Thus we are moving in a meta-hermeneutic, semiotic cycle of 'reason, undecidability, praxis and reflection upon action' instead of processes of habitual systematic circles, where the definition of the paradigm is objectively / independently existing. In this sense, we reinterpret the notion of the Kuhnian 'paradigm shift' –

initially analysed by Kuhn as a consequence of a series of conscious decisions made by scientists to pursue a neglected set of questions and later on as a situation of shifting paradigms within a context or network of indeterminable radical translations[27]- in terms of a meta-hermeneutic, ontologically systemic approach of, semiosis, deconstruction and psychoanalysis {see §5.3}.

2.3 Contemporary views of Epistemology

The contemporary views of epistemology[28] (or theory of knowledge) are considered the variable notions that describe the nature and scope of our knowledge as well as the character of scholarship positioned within the particular social and historical context of our epoch. Mainly influenced by the traditions of western culture, analytic and continental philosophy of the last two hundred years, these discourses of social understanding of epistemology[29], today are mainly described by the ideological products of the works of Michael Foucault, Jacques Lyotard, Jacques Derrida and others. According to Rosenau most of these thinkers

> *"… question the possibility of rigid disciplinary boundaries between natural sciences, humanities, social sciences, art and literature, between culture and life, fiction and theory, image and reality in nearly every field of human endeavor… they consider conventional tight definitions and categorizations of academic disciplines in the university context simply to be remnants of modernity…" (Rosenau, 1992)*

Contemporary thinking regarding a social model of epistemology departs from the employment of the notion of *épistémè* that appeared after Foucault's conviction that intellectuals engaged in rational enquiry confined themselves to the study of mere appearances or 'knowledge of things' and failed to explore human knowledge and its underpinnings (Drolet, 2004). Foucault illustrated the *épistémè* in his study on the history of the human sciences (Foucault, 1970) as an 'historical a priori' which:

> *"in a given period, delimits in the totality of experience a field of knowledge, defines the mode of being of the objects that appear in that field, provides everyday perception with theoretical powers, and*

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[27] Both Kuhn and Quine (Quine, 1960) supported the idea of the indeterminacy of radical translation among a variety of current paradigms. They argued that we are not in a position to decide which of the translations within a series of possible translations, is the one that should be considered the dominant. In this respect the problem of incommensurability remains unsolved.

[28] The term was introduced into English by the Scottish philosopher James Frederick Ferrier.

[29] There are many other epistemological positions including traditional epistemology, modern and postmodern epistemology, virtue epistemology, moral epistemology, naturalistic epistemology, religious epistemology, feminist epistemology etc. (Zalta, 2003)

> *defines the conditions in which one can sustain a discourse about things which is recognised to be true".*

Contemporary episteme is thus possible to "represent the currently discoverable universe of intellectual activity" in terms of the Foucauldian (Gutting, 1989) conception of the term, who seen the shift in our way of reasoning from the methodism presented by the Cartesian humanism, to what Foucault understood as "the épistémè of the individual", to the systematic fragmentation of our phenomenal world in search of the building blocks of the universe we participate (Foucault, 1970). As stated by Foucault, and similarly to Thomas Kuhn's paradigms (Kuhn, 1962), the épistémès of one historical epoch were to be thought as incommensurable with those of another[30]. The deployment of a non-conventional understanding about épistémè directed Foucault to argue that traditional approaches to the human sciences (positivism, realism, functionalism, behaviourism, cognitivism etc. were historically contingent and it was necessary to be thrust aside. In the direction of a Nietzschean reflection, Foucault supported the idea that human natural and social universes were neither ordered nor fundamentally intelligible but instead were characterised by randomness and discontinuity.

Foucault's *archaeological* approach, in search of a critical orientation of thought, involved investigation at the fundamental structures of thought. This is described by Foucault as a perpetual shifting through the layers of surface reality in order to penetrate to the hidden rules that govern the ways (in)dividuals realise themselves and the situations they experience. The archaeological method demonstrated the vanity of the traditional sciences, which preserved intact the faith in an autonomous and coherent human subject capable of discerning an overall pattern to human history and thereby show how the past informed the present (Drolet, 2004, p. 19). In reforming his ideas about épistémè, Foucault introduces the notion of *discourse* which bore a family resemblance with épistémè but also stressed an important timeless element of power relations embedded in all epistemological epochs despite their incommensurabilities. Discourse analysis was investigating the ways that non discursive elements changed our interpretation of theoretical outlooks or systems of thought. Following the Nietzschean concept of *genealogy* (Nietzsche, 2003), Foucault focused in criticising how power relations and discourses (or totalising discourses) repressed and marginalised certain human practices of though and knowledge formation. In a similar sense to the Lyotardian concept of *grand narratives* (Lyotard, 1984), the genealogical approach was never intended to become a *totalising*

[30] ambiguous analogies: ignotum per ignotius (the unknown explained by means of the more unknown), or obscurum per obscurius (the unclear explained by means of the more unclear).

discourse itself or a process of discourse overturning. Its focus was to deconstructively unveil conflicting situations of apparently stabilised systems of belief. Genealogy was considered a micro-politicised[31] model of thought that focused on releasing and *bringing into play, local discursivity* and *subjected knowledge.* As Michael Drolet emphasises genealogy is:

> *"…about giving voice to marginalised individuals or groups in their struggles to resist domination and transgress the boundaries of social propriety. It gave impetus to an anarchic impulse but did not guarantee liberation…" (Drolet, 2004, p. 21)*

In comparing Foucault's epistemological deliberations to Kuhn's thinking about scientific revolutions[32], the use of épistémè[33] can be asserted as being akin to Kuhn's concept of *paradigm* in spite of their decisive differences. While Kuhn's paradigm is an assemblage of assumptions that result in the institutionalisation of scientific beliefs and practices, Foucault's épistémè is not merely confined to science but to a wider range of discourse. In this sense science is conceived under the épistémè of an epoch. With reference to the Kuhn's *paradigm shifts*[34] which are considered as the result of intentional judgements made by mindful scientists who pursue a neglected set of questions, Foucault's épistémès are the 'epistemological unconscious' of an era, where the configuration of knowledge and its fundamental norms and assumptions are so vital to that episteme that become invisible to its participants. Although Kuhn's concept of '*paradigmatic shift'* seems to correspond to Foucault's notion of '*discourse'*, the latter also addresses how opposing theories could coincide within any epistemological epoch (Foucault, 1972). It is clear that Kuhn is not investigating the conditions of possibility of opposing discourses within an epoch of science, but focuses on the comparatively invariant prevailing paradigm that is thought to govern scientific research; supposing that one prevailing paradigm always saturates the ideological horizon, except under paradigmatic transition.

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[31] It was not politics of ideological struggle but rather micro-politics of resistance that can be compared to the ideas of Althusser, Deleuze, Lyotard and Derrida.

[32] Kuhn's and Foucault's epistemologies are both influenced by the French philosopher of science Gaston Bachelard's notion of an "epistemological break" (*obstacle épistémologique* et *rupture épistémologique*), as indeed was Althusser (Balibar, 1978). Bachelard proposed that the history of science is replete with "epistemological breaks or raptures" or unconscious structures that were immanent within the realm of the sciences, such as principles of division (e.g. mind/body).

[33] It was considered as a new critical orientation of thought and was introduced in order to deepen the analysis which could elucidate the predicament of the present.

[34] A paradigm shift is the term first used by Thomas Kuhn in his famous 1962 book "The Structure of Scientific Revolutions" (Kuhn, 1962) to describe the process and result of a change in basic assumptions within the ruling theory of science. It has since become widely applied to many other realms of human experience as well.

Despite the fact that Derrida falls in with the Foucauldian belief that the traditional approach to human knowledge/sciences was depreciated, he supports the idea that through the conceptions of archaeology and genealogy, Foucault still adheres to the assumption that there is an objective knowledge or ultimate truth that is existent or could be discovered (Derrida, 2002). For this reason Derrida believes that Foucault miscarries the plan of post-structuralism and therefore his theoretical construct is not able to break free from the doctrines of humanism. In order to achieve a final separation from the metaphysics[35] of humanism, Derrida proposes a new approach to philosophy (and philosophy of knowledge) known as *deconstruction*, where by engaging radical hermeneutics, linguistics and semiotics he (dis)places meaning in a mode of perpetual questioning {see §5.2.2}.

Contemporary theorists such as Badiou, Bateson, Rosen, and Zizek support the idea that radical post-structuralism (including the Anglo-US interpretation of the Derridean thesis, i.e deconstructionists) never really accomplished what it had intended (Badiou, 1999; Bateson, 1979; Rosen, 2004; Zizek, 2006). Taking it in a historical sequence, what began in the mid-nineteenth century - modernism and structuralism - as an attempt to reduce ambiguity by abstractly maintaining the consensus of a positive (order, truth, determinate law, fixed identity, structural functionalism, totalising scientific objectivity, consensus) ended in the mid-twentieth century with a lapse back into ambiguity - postmodernism and post-structuralism. The latter did not merely chose differences that are then supplanted by identities in an endless succession, but chose differences as such, pure *différance*. Characteristically Rosen states about the late Derridean conception of *différance*:

> *"In being so chosen, this 'higher-order difference' is made into a 'higher-order identity', a 'hyper-object' cast before the gaze of a new subject: the Derridean cogito, who might indeed be linked to the God of 'negative theology' – he for whom the 'hyperabsense' is present." (Rosen, 2004)*

[35] Metaphysics is defined as a theory of existence or in other words 'what something *is*'. This essence of 'is' is metaphysics; the quest to claim what can be said to really exist 'a priori'. Metaphysics thus have been dominated by the presupposition of the existence of the pure transcendental signified, uncontaminated by socio-empirico-historical culture. This is an ontological question as it searches the absolute essence of being. Metaphysics is therefore the logocentric definition of presence; the self-evident presence of an a priori existence or transcendental signified. This can be thought as equivalent to the Heidegger's Being, the meta-narratives of Lyotard, the Derridean logocentrism among others. Many of the opponents of metaphysics demonstrate a particularly difficult way of expressing their ideas primarily because of their refusal to pose any ground. Thus their writing is dominated by quasi-concepts outlined in a quasi-transcendental manner.

Other contemporary theorists of the '*reconstructive'* postmodern tradition like Best and Kellner, Bohm, Critchley, Griffin, Prigogine, Laclau and Mouffe etc, propose a dialectical transdisciplinary dialogue and not acrimonious polemics (Best & Kellner, 1997)(Bohm, 1994)(Critchley, Derrida, Laclau, & Rorty, 1996)(D. R. Griffin, 1988, 2007)(Prigogine & Stengers, 1984)(Laclau & Mouffe, 2001)(Mouffe & Holdengraber, 1989). In their view of the modern and the postmodern, substantive criteria are employed to judge the adequacy of scientific knowledge, while truth and objectivity remain guiding norms. They support the idea that we are still in a non-radical version of a postmodern era; A *quasi(post)modernism*, where we are critical/skeptical both for the scientific beliefs of radical modernism and the concrete messiness of radical postmodernism (Mumby, 1997). Modern and postmodern approaches are combined, for instance, in the dialectic of order and disorder, determinacy and indeterminacy, and structure and complexity playing a significant role in recent scientific discourses. This quasi(post)modern reconstructive scientific position is evident in the writings of Best & Kellner and Griffin:

> *"Thought postmodern science is critical of modern science, it does not in most cases seek to destroy classical modern notions such as self, purpose, meaning, reality or truth. As Gross, Levitt[36] and other neo-positivists fail to see, many versions of postmodern science refuse to terminate the critique of realism and determinism in relativism and nihilism, and postmodern criticism is directed against scientism, not science; technocracy, not technology; and rationalism (or 'logocentrism'), not reason. … One cannot say that postmodern discourse per se is either pro- or anti-science, only that there are postmodern positions that are used by different people in various ways" (Best & Kellner, 1997)*
>
> *"...[re]constructive ... postmodernism involves a new unity of scientific, ethical, aesthetic, and religious intuitions... [and] involves a creative synthesis of modern and pre-modern truths and values."(D. R. Griffin, 1988)*

It appears that the epistemological assumptions about the nature of the phenomenal world are being transformed in all fields of our socio-cultural environment, creating

[36] It is considered a truism that Gross and Levitt (Gross & Levitt, 1997) among others (Sokal, 1996a, 1996b)(i.e. the gang of three), misread the texts of Foucault , Derrida and other social constructionists of knowledge ranging from Berger and Luckman to the Frankfurt School. According to Best and Kellner (Best & Kellner, 1997) their superficial readings largely derived from secondary references, claiming that neither Derrida nor Foucault believe in an external world, reading Foucault as reducing knowledge to power while ignoring the vast range of positions offered by the social constructionists.

new configurations of understanding[37]. Hence, epistemology in this thesis is addressed as an investigating ideological process that allows us to examine our knowledge and its inquiry, supposedly composed of fluctuating entities in varying non-logocentric relationships within subjective or (in)dividual, socio-cultural and ideological contexts where it:

> *"… provides for both the dominant and the subordinate the proclaimed and its contradictions, the unities and the differences. … makes sense out of the local alliances and oppositions between and within fields and paradigms." (Anderson, 1996)*

In the succeeding chapters we will depict emergent traditionalistic, modern and postmodern paradigms in the fields of theory, philosophy and the sciences. To set the stage for a discussion, we short out the claims for and against theoretical (often contrasting) practices. Our position, analogous to the ideas of Best and Kellner (Best & Kellner, 1997), supports that we are currently in a meta-paradigmatic era, midway the modern and postmodern paradigms heading towards the development of a quasi(post)modern epistemological era of ontological speculation {see §5.3}. Thus, both modern and postmodern perspectives are considered pertinent, postulating creative ways of syntheses and a transdisciplinary framework in order to capture the complexity of the current state of affairs and developments in the domain of our interest (collaborative-systems design).

2.4 The Nature of the (Phenomenal) World

In this section we set the stage for the discussion of the 'real', following an archaeological analysis of the historical considerations of the ontological nature of the lifeworld. We depart our analysis from the dualistic tradition between actual and/or phenomenal and our aim is to present an approach that decentres this dichotomous conception of reality [Figure 2-2].

[37] An analogy can be made to the Kuhnian paradigms and their shifting processes.

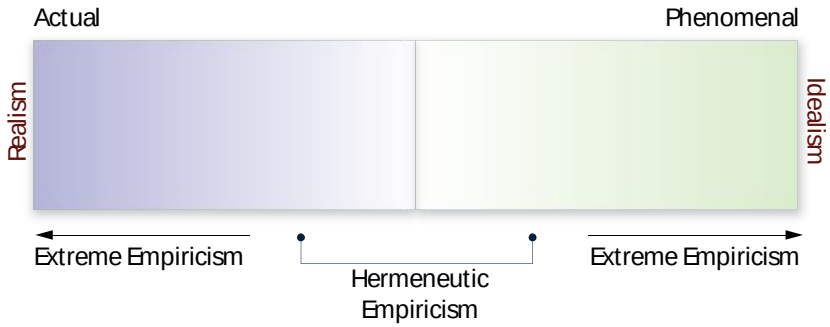

FIGURE 2-2 - EMPIRICISM: ACTUAL AND PHENOMENAL

Important notion for this investigation is considered the notion of *ontology*, including ontology of a theoretical framework, which makes a claim about the nature of Being[38] as such {see also §5.3.1}. Thus, ontology is considered the most general branch of metaphysics that makes assertions concerning the nature of a world outside cognisant-mind as it might represent itself as an object of inquiry. Following the Nietzschean problem of ontological reality and metaphysics[39] the discussion progresses between realism and idealism - where *essence precedes existence* and where *existence precedes essence*. The continuum is located somewhere between an *actual reality* totally existent and independent to a conscious mind and a *hyperreality* of a simulated world which is the result of an actor's perceptions[40]. In the case of an actual reality the proper understanding or its discovery validates a line of inquiry while in the case of an idealistic hyperreality, purely existent in the mind of the inquirer, the factual is the result of one's own inquiry.

[38] The most basic question of being is "What is, *is*".

[39] A stated by Nietzsche, "It is true there could be a metaphysical world; the absolute possibility of it is hardly to be disputed. We behold all things through the human head and cannot cut off this head; while the question nonetheless remains, what of the world would still be there if one had cut it off." (Nietzsche, 1996)

[40] Another important distinction in terms of knowledge construction is evident in the philosophical hiatus between rationalism and empiricism where rational knowledge attributable to reason is contrasted to perceptual knowledge which is highly dependable to the senses. Today this contrast is considered to be an oversimplification of the issues involved in a comparison between the various versions of rationalism and empiricism. It is historically evident that the main supporters of rationalism (Descartes, Spinoza and Leibniz) were also advocates of the empirical scientific methods of their time while Locke –from the empiricists- held that some knowledge could be directly accessed through reason.

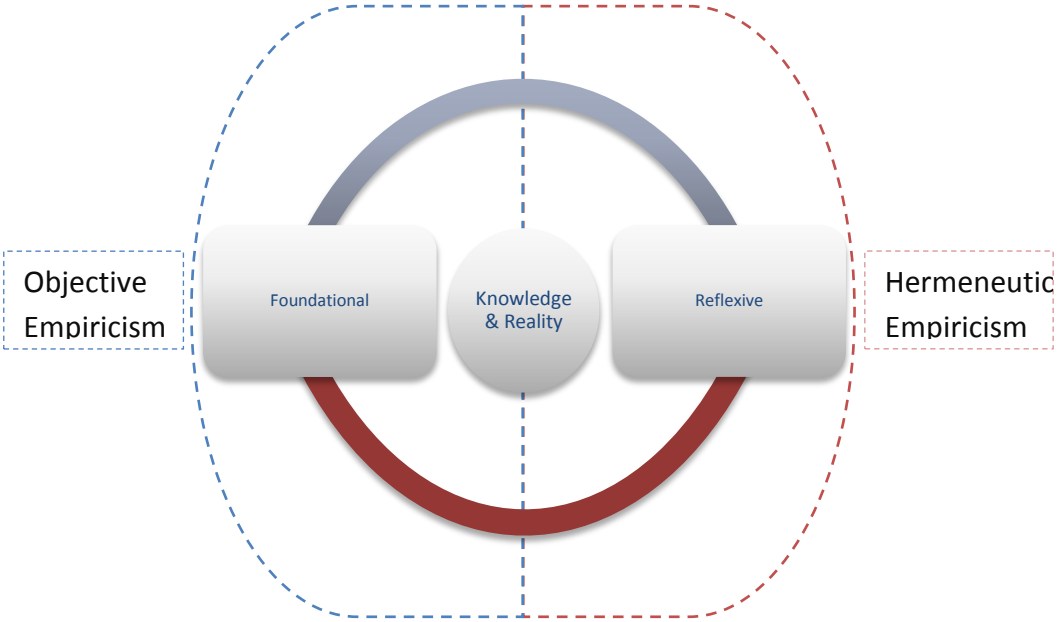

Figure 2-3 –Ontology of the Real: Objective and Hermeneutic Empiricism

Therefore ontological investigation can be directly correlated with *objective and hermeneutic empiricism* where the first focuses on the *foundational* explanation of reality and knowledge (either realistically material or idealistically phenomenal) while the latter sees reality from within a *reflexive*, discursive and non-marginal mode of interpretation though it faces the problem of infinite regression [Figure 2-3].

2.4.1 Investigating the Real: Objective and Hermeneutic Empiricism

It is generally supposed that the doctrine of empiricism was first formulated by John Locke[41] who posed that "all of our knowledge and ideas arise from experience" (Locke, 1690) and rejected the possibility that anything is knowable through innate ideas[42]. As we mentioned earlier, two worldviews derive from this ontological assumption concerning the nature of knowledge and reality: objective and hermeneutic empiricism.

For objective empiricism observed phenomena are naturally configured, perceptually accessible but autonomous of the observer's perception and reside on a predefined network of relations in which their characteristics and actions are dependent on other actual phenomena. This foundational position considers the objects of our analysis as independent phenomena which simply become the subject of our claims. This type of foundationalism [Figure 2-4] is often coupled by tree types of criteria regarding the real: the *materialist*, the *reductionist* and the *determinist*.

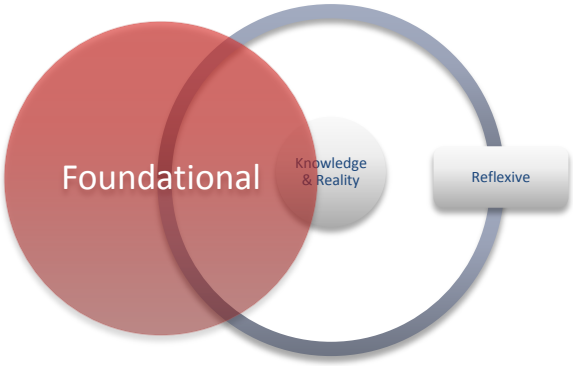

FIGURE 2-4 - FOUNDATIONALISM

When objective empiricism is coupled by the *materialist* conception, reality is believed to become evident only in structural material entities. The most admired materialist axiom supports that "matter exists independently from any observing actor" (hylo-materialism[43]). In this case, reality is only accessible by direct

[41] Locke by rejecting his earlier understanding of the doctrine of "innate ideas" and insisting that all of our ideas come from or through a combination of senses and experience, it can be said that he was a "rationalist" as regards the nature of knowledge itself.

[42] Locke believed that the human beings are born with no innate or built-in mental content thus human mind is a *tabula rasa,* or in other words a 'white paper' on which experiences of the lifeworld place their traces.

[43] *Hylomaterialism*, deriving from the Greek hyle/matter states that all realities the build upon the physical e.g. life, mind, consciousness, etc, are synonymous with, and hence reducible to the physical. For instance, thought is considered an absolute deterministic process that in reality is expressed as an electrochemical neural impulse in the brain. Thus, hylomaterialism is reductionist primarily because it asserts that emergent phenomena that operate on the

investigation and collection of information related to these material and structural entities. Arguments over non-material structures, like ideas, theories, ethical issues, etc., move further away from the analysis of the real as many materialists might claim.

Objective empiricists that support the notion of *reductionism* believe that reality, and in extent our knowledge that is related to it, becomes evident through the incorporation of a single field of theoretical inquiry that is supposed to underlie all knowledge. A typical reduction in the modernist paradigm of Newtonian tradition would hold that the base of all our knowledge regarding nature of reality could be reduced to the field of physics. Based on the foundational notion of *absolute holism* and the *unity of science,* the reductionist hypothesis would assume the belief of a unified reality. According to this, all phenomena are the consequences of a single event that derive from the same theoretical conception[44] and therefore the universe/real is explained by a finite set of statements.

Another facet of objective empiricism is considered the notion of *determinism* where all real/observed phenomena reside on a transcendent cause. This cause is represented as a patterned sequence of events that allow any observer to successfully determine or anticipate a series of factual events. It holds that nothing is random, but everything happens for a specific reason or purpose that derives from some agency, reason or necessity[45] (Bunge, 1979). This interpretation of the (phenomenal) world, in terms of materialism, reductionism and determinism, provides an image of a scientific body that is continually progressing through enriched guesstimates of the assumingly fixed conditions that dominate and/or compose this world. The conceptual risks that arise because of these ideas can be seen in the inevitable codification and perpetual reproduction of prior knowledge where scientific inquiry itself disappears by giving place to a stable symbolic mode of belief reproduction.

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physical, have no intrinsic existence of their own, and can only be explained solely in terms of physical laws.

[44] Reductionism of this type would argue that all cultural aspects of our civilization can be reduced to interactions at a sociological level; sociology can be reduced to an understanding of the self or the theoretical domain of psychoanalysis that deals with it, psychoanalysis can be reduced to biological states of interaction, biology can be reduced to chemistry and chemistry can be reduced to the all encompassing domain of physics that underlies all observations of the aforementioned domains.

[45] Based on the ideas of atomism of Leucippus and Democritus and Epicurus: Nothing happens at random (μάτην), but everything from reason (ἐκ λόγου) and by necessity. («Ουδέν χρήμα μάτην γίγνεται αλλά πάντα εκ λόγου τε και υπό ανάγκης»)

Materialism of this sort runs into difficulty when we begin to extend the domain of the real to immaterial or ideological entities where we have no physical access in terms of correlating mechanisms that will outline their causal associations. These ideological elements (i.e., pleasure, enjoyment, anger, creativity and other personality characteristics) are considered as speculations that are caused because of our interaction with the material world. The problem with this materialist conception of reality is that it renders these notions as ultimately accessible through methodologies which in turn are considered objective measurement tools that adequately represent reality as such[46].

As a theory of interpretation, the hermeneutic tradition and its philosophical expressions turn not only to the conditions of possibility for symbolic communication as such, but can be linked to that of human life and existence. It is in this form, as a type of interrogation into the deepest conditions for symbolic interaction and culture in general, that hermeneutics has provided the critical horizon for many of the most intriguing discussions of contemporary philosophy (Ramberg & Gjesdal, 2005). Ricoeur in his early thesis "Symbolism of Evil", sees hermeneutics merely as a method of interpreting symbols (Ricoeur, 1967). Later Ricoeur's hermeneutics are refined into a theory of interpreting discourse as a whole, including, but not confined to, the symbols which any discourse contains. Essentially, for Ricoeur contemporary hermeneutics develop to 'a theory of text', which takes texts as its starting point, but ultimately comes to see the world as textual (or as we interpret it in this thesis (con)textual), insofar as human existence is expressed through discourse, and discourse is the invitation humans make to one another to be interpreted (Simms, 2002, p. 31).

Thus, while the early notion of hermeneutics addresses understanding and interpretation of linguistic and non-linguistic expressions (i.e., general symbolism), in its later expressions identifies its inability to provide enough evidence of the contextual boundaries - where this interpretation is seen to be always related to-, and expands its interpretative practice beyond symbolic meaning. This mainly derives from the different interpretations of Heidegger's work from Gadamer and Derrida and is it brought forward in a famous debate between them that took place in Paris 1981 (Ramberg & Gjesdal, 2005) and inaugurates the era of *contemporary hermeneutics* or *meta-hermeneutics*. In this debate, Derrida questions the idea of a

[46] Examples include Operationalism and Ethnography. In Operationalism an object of inquiry is operationally defined according to the methodological instrument that will determine its characteristics. This methodological measurement tool becomes the object against which reality is evaluated while immaterial/ideological elements are materialised through its incorporation. Similarly in ethnography the method is to collect socially determined and presumably existing practices, and in terms of reductionism to evaluate them against a materialist argument (e.g. empowerment in organisations).

continuously unfolding 'continuity of understanding' in communication and insists that meaning is not based on the 'will to dialogue' alone or to the expansive limits of communicative practice. Derrida argues that communication is becoming possible by its own absence, by its impossibility to communicate, by the relations of linguistic signs to other linguistic signs within the ever-evasive network of structures that language ultimately is (or becomes). Hence, communicative actions and interpretation of (con)texts, for Derrida, are not teleological processes that focus in necessitating interaction and/or providing mutual consent. Communicative actions are interactive processes, events or relationships in which participants are engaged in order to contest disagreement and dissemination:

> *"The ethics of hermeneutics, consisting in the recognition of the possible truth of the other's point of view, tends to cover up the way in which the other escapes me, the way in which the I always fails to recognize the thou in its constitutive difference"(Ramberg & Gjesdal, 2005)*

Hermeneutic empiricism is the anti-foundational opposite of objective empiricism [Figure 2-5]. In opposition to the belief of a fixed reality or knowledge, it supports the idea that the phenomenal world is fragmented and that it can only be understood in terms of human knowledge scattered in multiple domains of reality representation. It understands reality to be dissipated across various formulations of knowledge production, criticising the posed centre of foundationalism where all phenomena derive from a unified and consistent (knowledge/belief) domain.

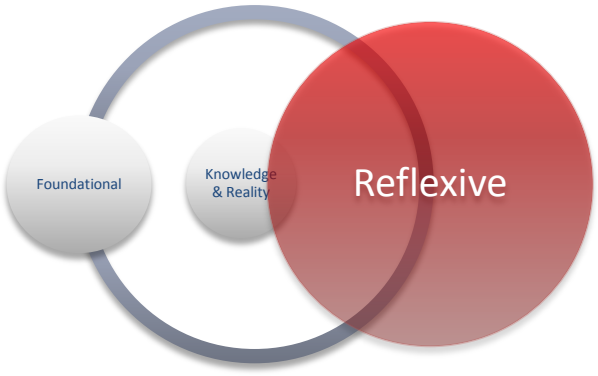

FIGURE 2-5- ANTI-FOUNDATIONALISM

According to hermeneutic empiricism there is no unity of science - knowledge in one domain has little relation/influence in another - but instead scientific domains are being evaluated under the umbrella of the domain of the sign where signification and meaning dictate in a reflexive context of theorization (which itself can be seen as a logocentric belief {see §5.2}). Deterministic causality and reductionism of objective empiricism are replaced by *downward causation (or causality)* where*:*

"…all processes at the lower level of a hierarchy are restrained by and act in conformity to the laws of the higher level…" (D. T. Campbell, 1974)

This type of causation rejects the early-systemic notion of determination where the parts establish a concrete image of the whole while the latter defines their properties, as well as modernist scientific methods that preclude formal or final causes, in the Aristotelian sense of the notions[47]. Instead, downward causation advocates that the whole has emergent properties[48] which cannot be reduced to properties of the parts by noting that *the 'whole is greater than the sum of its parts'*[49]. It is needless to say that this statement can be better portrayed when we consider the inaccessible nature of the "whole", where it presents itself as a paradox in the sense of the ontology of being {see §0}. If we consider that there is nothing apart from situations where parts and wholes coexist in a paradoxical relationship of interdependence and co-evolutionary development, then ontology, if it exists, is a situation of presented multiplicities (Badiou, 2007). Consequently, there is no concrete structure of being, as it cannot be 'absolutely' presented because it occurs in every presentation. Thus, the sovereign subjective mind that introduces the question of the inaccessible 'whole', fails to provide an alternative understanding of the Hegelian dialectic, an interpretation that does not produce a reconciliation or a synthesised viewpoint but, instead, an acknowledgement that "*contradiction [is] an internal condition of every identity"* (Zizek, 1989, p. 6); including the vagueness of its own identity. Therefore the 'whole' can be possibly greater, less or even equal to the sum of (its) parts, and is precisely this contradicting feature that provides enough meaning to the statement and makes it able to penetrate the stability of logos of a knowing subject of the second order of ontogeny {see §5.3.1}. For more on the '*ontology of being*' see (Badiou, 2007, pp. 23-30)[50] while for a 'reversal' of Hegelian dialectics see (Zizek, 1989).

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[47] These are considered by many scientists the cornerstones of the modernist conception of causation where one event or cause must always precede its effect. According to this conception of causality: "*An effect (a system) can never cause its cause (the parts)*" (Hulswit, 2005).

[48] Often described as *strong emergence,* where the qualities of the whole (or system) are irreducible to the system's constituent parts (Chalmers, 2006) (Queiroz & El-Hani, 2006b).

[49] This statement has been attacked by positivists and operationalists due to its ambiguous character. Heinz von Foerster argues that this is because the statement itself is poorly formulated. Instead proposes: *"A measure of the sum of the parts is larger than the sum of the measure of the parts"*. This, he considers, can be formulated in even more precise, mathematical terms (Foerster, 1962).

[50] Nowadays many researchers avoid the use of holistic notions in their argumentation and disavow privileging the one side of dubious comparisons. In domains like politics, culture, anthropology and other sociocultural contexts, there are many cases that holism has been confused with the oppressive facets of functionalism and utilitarianism (Harris, 1998). Hence, there is no need to determine the nature of the parts in terms of a perpetually slippery 'holon',

In terms of *scientific discovery*, downward causation assumes that the material must take precedence in a chronologically progressive order, for the biological and consequently for the semiotic to exist. The semiotic is in turn the basis for understanding both the material and the biological; for the semiotic to exist, it is considered necessary that the material and the biological are already defined as fields of knowledge[51]. In downward causation the development of subsequent domains of knowledge should accept the axioms of the previous domains but the descendant domains introduced will develop irreducible axioms, in terms of signification, with the pre-existing domains (Andersen, Emmeche, Finnemann, & Christiansen, 2001). In comparison with the traditional models of determinism, determination in downward causation is never fully achieved in the physical but only as a symbolic process {see §5.2.5.3}. The formulation of a systemic stance neither leads to radical reductionism nor radical holism:

> *"The whole is to some degree constrained by the parts (upward causation), but at the same time the parts are to some degree constrained by the whole (downward causation)." (F. Heylighen, 1995)*

Consequently, hermeneutic empiricism finds its targeted phenomena for determining reality and knowledge in this contemporary stance in systems thinking and/or the domain of signification. Thus, the role of the hermeneutic empiricism is to put into play the objective world that is found in the paradigms of the objectivist camp. What is proposed here is a model of signification where non-deterministic, creative, collaborative, actionalistic, products of human achievements govern in a multi-culturally, fragmented context that is under continuous development. Notable is the

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or the supremacy of a fundamental totality and its ever fluctuating parts. It is obvious that we must not abandon the logical and empirical foundations of science, but in conjunction with it we must also consider the sociocultural, biological or semiotic phenomena that evolve in conflicting interpretations of the dynamic nature of the social milieu, the physical and the symbolic.

[51] Downward causation is not considered a flawless notion that can easily describe phenomena. Regarding its terminology (Hulswit, 2005) states: "*If we limit ourselves to the concept of downward causation, we may say that we refer to downward causation whenever we are in the presence of a situation in which certain aspects of the active elements of an active physical whole can be adequately described only by referring to some causal influence of certain aspects of the active whole.*" But he argues that these paradoxical notions of causations are often not clearly put, admitting that are often *awkward or misleading*. Characteristically he points out: "*On the basis of an extensive exploration and analysis of some representative discussions on the subject of downward causation in the literature, we have concluded that the concept of 'downward causation' is muddled with regard to the meaning of causation and fuzzy with regard to what it is that respectively causes and is caused in downward causation."… "in our attempt at baring the difficulties underlying the discussions of downward causation, we have concluded that in most cases 'causation' in respect of 'downward causation' is understood in terms of explanation and determination rather than in terms of causation in the sense of 'bringing about.' Thus, it would appear that the term 'causation' is badly chosen.*"

improvisational signification through human action where material facts become processes and scientific knowledge becomes performance within an actionalistic model of interaction.

The contrasting knowledge practices of objective and hermeneutic empiricism and their beliefs regarding the evaluation of reality can be summarised in the following conceptions (Anderson, 1996):

[1] For the materialist in objective empiricism, there is an independent, singular, material world that gives rise to physical and ideational phenomena that are naturally defined while for hermeneutic empiricism the "real" of social life transcends -but does not deny- the material world and is a product of the human mind in collective action. The "real" require some set of material practices for its production and for the recognition as the real.

[2] In objective empiricism the phenomena are autonomous and ahistorical in their reality while for hermeneutic empiricism, material practices of reality production centre language and significance as well as communication and meaning, as their primary devices.

[3] In objective empiricism the components of the material world exist in determinant relationships that persist across time and place while in hermeneutic empiricism the structural reality is revealed from some vantage point.

[4] Language in objective empiricism is in itself referential and it often references to phenomena that can objectively be traced. In terms of its structuralist conceptions about representation, language is understood as a referential mechanism than can be objectively used to characterise the fabric of reality and the relational means that are involved in its constitution. The result of this structuralist idea is to undermine subjective agency by putting in its place the autonomy of linguistic structures. On the other hand for hermeneutic empiricism, the process of revelation and signification is explanatory; equally for the point of observation as well as for the nature of reality.

[5] Often objective empiricism in its humanist manifestations centres true knowledge to the *knowledgeable* individual. For hermeneutic empiricism the observing subject is seen as a (in)dividual, fragmented subject who himself is part of the reality production process.

2.5 Summary

The aforementioned analysis informs us that the interpretation of the real diverges from intolerant materialism, where only material entities (objects as such) count, to a liberal pragmatism in which attributed action operates as a verifiable mechanism of the real. In the first case, the application of radical materialist beliefs toward purposeful communication, participation and collaboration theories appears cumbersome and is rarely encountered. For instance, ethnographic practices often initiate in material practices, but eventually transfer their inquiry to some kind of

non-material investigation; often described by a cognitive structure or subjective agent. In the second case, hermeneutic positions define reality amid a material real and a conscious/interpreted real and contend that human activity is equally the result and the cause of this relationship. At the margins of the hermeneutic positions where the purpose is to fully break with the determinism of the materialist conception of the real, we find arguments concerning a transcendent mind and an apeironic interpretation of reality where the materialist criterion totally fades out. These radically idealistic and pan-semiotic positions recur infinitely (and regressively), often within a nihilistic attitude of denial of creative events as they focus to the duplication of epistemological assumptions.

Our aim is to position our research within a *meta-hermeneutic* paradigm of speculative realism that avoids the radical manifestations of the hermeneutic traditions and the necessity of a concrete material reality. Therefore this is to become a quasi-representational position of theoretical diversity that involves important factors which reject the empiricist criterion of the significance of cognitive products[52] primarily because of the amphiboly of (in)commensurability between modes of understanding experience itself. For this reason we turn away from both fundamentally depictive interpretations of the real where the material is seen only as a result of human activities of hyper-representation - something Deleuze calls *hylomorphism* (Deleuze & Guattari, 1972) - as well as extreme materialist interpretations where reality is assumed as independently existing. Therefore the approach outlined in this thesis, aims to 'locate' itself amid the static materialist and the radical idealist interpretation of the real and, without completely rejecting both of the them, to turn towards a *systemic (de)constructive ontology* that takes place within the flexible boundaries of a meta-hermeneutic framework for describing the present as an evental site or a process that inhibits metaphysical accounts {see §5.3}. This we support is not motivated by the desire for a "transcendental signified", is against any '*metaphysics of presence*' (Derrida, 1976), tries not to imply any contradiction and at the same time by rejecting the completeness and the causal closure of the physical world and human relationships attempts to give us ground towards an analysis of complex practices like communication and collaboration.

[52] Here we propose the rejection of logocentrism around a cognitive product and not cognitive processes, although cognition is not the means of constructing reality per se but only a by-product of reality the is involved in reality constitution.

3 The Nature of Reality and Knowledge

3.1 Introduction

Contemporary theories of reality and knowledge construction (epistemologies) depend upon a variety of ontologically *descriptive principles*, and at the same time try, in an interminable way, to define and justify the nature of their inquiry. The constitution of these principles is often categorised and/or characterised in terms of different epistemological practices. These practices are defined in relation to the objective and hermeneutic varieties of empiricism and focus on some kind of *constructivist (or constructionist), critical* or *reconstructive postmodern* orientation of knowledge establishment and reality determination [Figure 3-1].

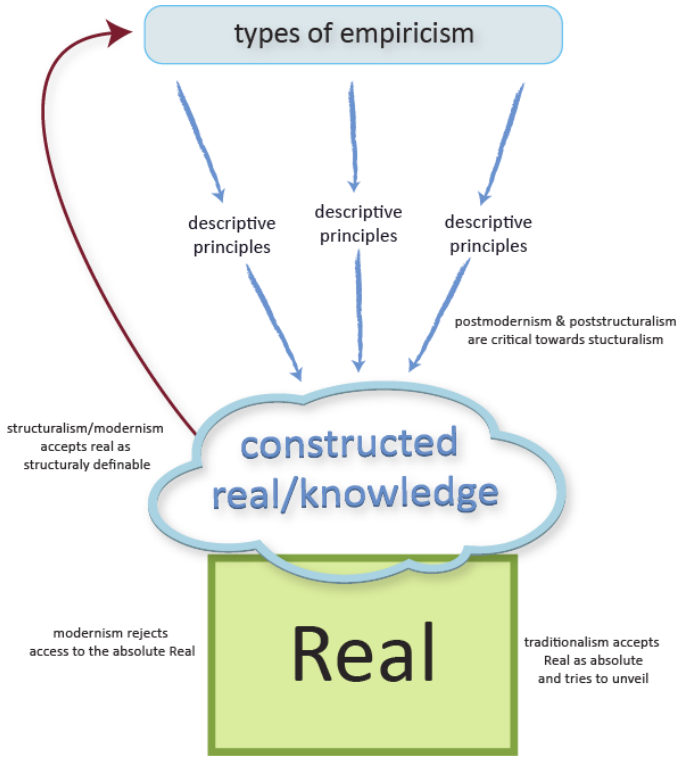

FIGURE 3-1 – EMPIRICISM: REAL, CONSTRUCTED-REAL AND POSTMODERN CRITICISM

As we have seen in the previous sections, hermeneutic approaches, of constructive modernism and reconstructive postmodernism, oppose the foundational ideas which arise from the objectivist forms of empiricism. These, hermeneutic approaches move beyond the traditional empiricist views (where all intelligence is singular in nature) and approximate reality of lifeworld and knowledge in a rather pluralistic non-teleological way. This takes place in two stages beyond traditionalism {see also §5.3.1}. In the first stage constructive modernism is critical and disavows the beliefs of the traditionalistic views where the whole of Reality (with a big R, the actual, objective Real) is to be revealed and knowledge is to be discovered rather than

constructively invented. Thus, constructive modernism argues that the absolute character of the contents of the Real is not directly accessible but instead expose meaning, understood only in terms of a representational model of the real. This hermeneutic move, changes the world from a 'world of material objects' to a 'polysemic world' of material semiotic potentials. In this latter conception of the world there still exist material foundations to be interpreted, but what is observed is always a product that is constructed by a system or aggregate structure, e.g., the mind, the collective. Glasersfeld clearly stated the differences between the traditionalistic realism and constructivism:

> *"The crucial difference between the realist and the constructivist, thus, is not that the one projects his cognitive structures beyond the experiential interface, while the other does not; the difference is that the realist believes his constructs to be a replica or reflection of independently existing structures, while the constructivist remains aware of the experiencer's role as originator of all structures, i.e., for the constructivist there are no structures other than those which the knower constitutes by his very own activity of coordination of experiential particles." (Glasersfeld, 1987)*

Thus, there exists a reality that is no longer universal or materially-constructed as the realist[53] position argues, but its existence is related to the structural determination that derives from the variety of modernist interpretations; constructivism, social constructionism, structural semiotics, linguistics, systemics, cybernetics, anthropology, psychoanalysis to mention a few. For many philosophers, (radical) constructivism made the ultimate break with realism and installed the core for the initiation of postmodernism and post-structuralism.

In the second stage of hermeneutic empiricism the structurally defined semiotic object of the modernist thought is critically evaluated. Thus, knowledge about the real is seen as fragmented and plural. There exists no structure or totalising narrative that "speaks on behalf of", no external metaphysically defined position (logocentrism) that will lead to the objective, socially constructed, consensual, interpretation of a constructed real (Lyotard, 1984).

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[53] Realists argue that constructivism endorsed to the mistake of the ontological position of idealism where there are no objects that exist independently of minds, experiences etc. Glasersfeld denied this accusation by both disavowing realism and idealism: *"For believers in representation, the radical change of the concept of knowledge and its relation to reality, is a tremendous shock. They immediately assume that giving up the representational view is tantamount to denying reality, which would indeed be a foolish thing to do. The world of our experience, after all, is hardly ever quite as we would like it to be. But this does not preclude that we ourselves have constructed our knowledge of it"* (Glasersfeld, 1996)

These two stages of hermeneutic empiricism are most evident in the philosophical practice of modernism and postmodernism and the questionable intellectual debate that commenced between them late in the 20th century. Therefore, in the next sections we focus in expanding our analysis towards exposing their key conflicting arguments. On the one hand we consider this as an essential move for understanding the tenets of contemporary philosophy while on the other we anticipate it will assist us in developing our theoretical position. The method of analysis we advocate in the following sections considers the characteristics of the two major approaches of modern and postmodern empiricism, as articulated in current literature, and later {see §3.2} takes up the specific issues of understanding the construction of reality and knowledge in terms of a number of traditions, including the constructivist / constructionist, critical, pragmatic, semiotic, sociocultural, phenomenological, sociopsychological.

3.2 Modern and Postmodern Empiricism ('truth games')

3.2.1 Modernism and Postmodernism

Modernism in philosophy is alleged to start out with Descartes and his quest for a description of knowledge that is considered self-evident to reason and secured from any sceptical doubt. Moreover, modernism that became tautological with Enlightenment supports the ideas that emerged from the Kantian critical revolution in the philosophy of 'epistemes', ethics and aesthetic judgement. The main belief of modernism supporters was the idea of re-examination of every aspect of existence, from commerce to philosophy, with the goal of finding that which was "holding back" progress, and replacing it with new, and therefore better, ways of reaching the same end. In essence, the Modern Movement argued that the new realities of the 20th century were permanent and imminent, and that people should adapt to their world view to accept that what was new was also good and beautiful. Modernism for Cooper and Burrel is derived from the notion of 'reason' or scientific logic, which is held to be the highest of human attributes that seeks to explain causal relationships (Cooper & Burrell, 1988). This objective rationality, according to Harvey, *"… took on multiple perspectivism and relativism as its epistemology for revealing what it still took to be the true nature of a unified, though complex, underlying reality"* (Harvey, 1989). This means that although in modern knowledge, diversity is acknowledged, there exists a meta-narrative, common and unified that is privileged and dominant. Habermas reflected on this logic as the "… re-labelling against all that is normative" but his work seeks to reverse binary oppositions and privilege metanarratives. In modernism the privileged power of 'reason' is considered as a central explanatory principle that claimed superiority of scientific thought over all other dogmas. 'Truth' supposed as identifiable through the causal relationships of a transcendent and pre-existing natural world. Modernism encouraged the idea that an important shift in human history took place by the combination of such themes of scientific evolution, reason, individuality, freedom, truth and social progress. The industrialisation of work

through the mechanisation of work processes was thought to regulate human creativity, but has been criticized by many thinkers who argued sceptically that modernity cannot achieve the ultimate objective truth and freedom that demands.

Philosophers of the late 20th century supported the idea that the modern project of human liberation as the unfolding reason through the self-conscious appropriation of nature and the rational establishment of society has been destabilised by the effects of the recent technological achievements, the reflexive evaluation of scientific knowledge and the influence of mass media upon modern societies. The products of modernism destabilised its own unity. A complex and fragmented world was the outcome of these developments in which the continual elaboration of numerous heterogeneous interpretative schemata has removed the possibility of any privileged or 'objective', Archimedean point of view upon which to build a singular and progressive conception of human history. This situation produces a 'weak ontology' that demands a corresponding weakening of philosophy's traditional metaphysical aspirations in the direction of 'weak thought' (pensiero debole), an approach Vattimo Gianni associates with the notions of nihilism and difference elaborated by Nietzsche and Heidegger. In philosophical terms postmodernism critiqued the Enlightenment values and truth claims, and as Power points out: *"In its most stark sense, postmodernism stands for the death of reason"* (M. Power, 1990). For Power postmodern analysis succeeds in distancing itself from the assumptions of unity implicit in the Enlightenment notion of reason. The most important contribution of postmodernism on contemporary though can be identified in its position *"to reject that reference is, or can be, a univocal relation between forms of representation and an objective, external world"* (Hassard & Parker, 1993). Postmodernism is not a complete unified theoretical development (a philosophy) and because of its diversity and philosophical theses it is impossible to think of it as such. Postmodernism is a collection of ideas of related concepts that arose during the 20th century in a variety if disciplines including sociology, philosophy and literary criticism and linguistics. When trying to identify postmodern positions we are confronted with a diverse set of standpoints, although commonalities can be found within the variety of theses. Postmodernism though gives us striking new ways of understanding knowledge, where we proceed from a situation where knowledge comes without foundations. We can also develop novel ways of connecting 'persons' with 'social organisations'. The postmodern emphasis on undecidability will help prevent our epistemological position from developing into orthodoxy (Hepburn, 2002, p. 226).

3.2.2 Modern and postmodern conditions

Whenever we are to consider the discussion of the similarities and differences of the modern and the postmodern conditions that guided the intellectual status of the last century, we are confronted with one key question: What are the similarities and differences of the *radically-modern (constructive)* and *reconstructive postmodern* types of empiricism that locate themselves in the midst of the hermeneutic axis? [Figure 3-2]. In this section we will provide a brief analysis of the most prominent

theoretical concepts that clarify this relationship. It is important to note that our aim is not to strengthen or to dismiss the hiatus that historically emerged between the modern and postmodern traditions but to (de)constructively unveil the meaning that has been concealed behind the debates. By focusing on disposing the issues of ontology of the marginalised versions of both the modern and the postmodern, we express an incredulity towards any 'great narratives', and instead propose a critical stance that makes our involvement in practical aspects more reflexive.

Radically-modern (constructive) empiricism sees our engagement with the perceptual and conceptual constructs (i.e., our intelligence) as an ongoing, open-ended process in ways dependent on collective accomplishments. Therefore our ways of constructing (our) knowledge (epistemology) about the nature of an actual world is to be seen as partial and never complete while the phenomenal world itself is always differing from a materially-concrete foundation that derives from the traditionalistic and positivist views of the past. This constructed lifeworld is considered plural and heterogeneous, mainly because phenomena that characterise it arise in a variety of different domains. Thus, ontological and epistemological postulations about the nature of real and knowledge are driven by a number of different domains and factors that co-exist and emerge within an interpreted horizon of meanings. Regressively, these very effects of consciousness influence, in a recursive manner, the defining of lifeworld.

This emphasis of constructive empiricism on 'phenomenal world' and the consequent development of a structurally defined symbolic network that 'speaks for' every situation and resembles the relationship between the actual and the phenomenal, is the main target of postmodern, post-structural and other deconstructive viewpoints. In their radical expressions these viewpoints try to dismiss any posed centre (radically against any grounding of meaning) and abandon any, 'transcendent' as it is usually called, relationships between structure and signification (against any classical signification that tries to stabilise the relationship between the signifier and the signified). However, on their critical expressions, deconstructive viewpoints try to unveil the weaknesses of the structural approaches by relativising logocentric structures and focusing in providing alternative arguments that elaborate on the analysis of the act of signification itself. This semiotic turn of the post-structuralist era starts by studying the processes of signification in a way that signs become recursive - instead of focusing exclusively on signified meanings, signs come to focus on themselves (signifiers are themselves explicitly signified) - and ends to the radical postmodern view of infinite recursion ad infinitum (the hall of mirrors effect, where

each mirror reflects the others but nothing except mirrors to be reflected. There is no absolute or final signifier)[54].

Positions within the postmodern condition envisage that the notion of intelligence is the combination of the domains of the semiotic and the sensory and take as essential the acceptance of the inability to provide a complete reflection of the real. Their major difference to constructive empiricism, of the modernist approach, is that this reflection of the real can not be described by the additive behaviour that radically instrumental modernism supported. This is primarily because postmodern empiricism refuses the existence and validity of an additive mechanism of the plural, and secondarily because it relies on the belief that there are no measurable parts that can be objectively observed. According to postmodern ideas the phenomenal reality is not merely pluralistic and greater than its material foundations, but also different from the observations that can be given from any vantage point towards explaining the absolute. Observations are inherently contained and thus their objectivity is questionable.

This turn to include the observer in the observed phenomenon and thus to escape the modernist epistemological lapse, is evident in a number of works ranging in a variety of contemporary epistemic disciplines that emerged in the postmodern era (constructivism, semiotics, second order cybernetics). The synthesis of these novel ideas introduces new questions regarding the status of the current epistemic beliefs in a number of theoretical issues that we will explore in the subsequent sections.

Thus, in the following we direct our attention to this set of issues related to the wider epistemic domain of communication studies and their consequent influence to social, organisational and technological research including collaboration, design and systems-design, in the context of modern and postmodern paradigms. In the first place, we engage with the characterisation of the relationship among modernism, postmodernism and communication studies and we suggest how to see more productively their relation. In particular we argue that the uncritical equation and/or differentiation of positivism, interpretivism, criticism and post-structuralist deconstruction under the authority of modernism and postmodernism seriously

[54] A new signifier is needed to signify what had been the signifier, but this new signifier is depends on signification by still a newborn signifier. Each time the implicitly tacit operation of the signifier is undermined by being explicitly signified (i.e. supplemented in Derridean terms), the functioning of what had been signified by that signifier is also affected. For example in language, terms and other illocutionary acts that are meant to signify, as well as that the *objects of signification* which are supposed to be signified, are continually disintegrate and reform in different structures of temporal unification. The signifiers and the signifieds continually submit into a never-ending redefinition. Such acts and structures might transiently infer meaning for an observing agent, but they are never considered to directly signify that which seems to present itself as the presentable (obvious).

distorts the intellectual status upon which contemporary scientific thought is based, and hence contributes to the constant reproduction of misunderstanding in various fields of scientific research [Figure 3-2]. Therefore, our focus is twofold. On the one hand we try to avoid the complete dismissal of the critical, poststructuralist and deconstructionist approaches to scientific research (Sokal, 1996b)(Gross & Levitt, 1997), while on the other we also try to avoid the relatively uncritical appropriation of postmodern as an alternative to modern and its nihilistic conceptions (Fukuyama, 1989, 1993, 2003). It is historically evident that these extreme accounts leave both modern and postmodern approaches under-theorised and hence contribute to a lack of understanding of the continuities and discontinuities that exist between them. A number of thinkers identify this (Rosenau, 1992)(Natoli & Hutcheon, 1970)(Hassard & Parker, 1993)(Best & Kellner, 1997)(Gabardi, 2000)(Cahoone, 2003). Consequently, similar to a number of researchers of social, organisational, political and cultural disciplines (Lyotard, 1984)(M. Power, 1990)(Best & Kellner, 1997)(Deleuze, 1990, 1997, 2001)(Badiou, 2005, 2007) our intent is not to enunciate a fixed theoretical account of the relationship between the modern and the postmodern but rather to suggest practical means that contextualise collaboration and systems-development issues around the discourses that derive from mainstream social sciences, linguistics, psychoanalysis and systems theory, including social constructionism, communication theory and social psychology research. According to social and communication theorists (Anderson, 2004)(Leeds-Hurwitz, 1995)(Mumby, 1997) that also identify this hiatus of modern and postmodern, these discourses can include: *discourse of representation* (positivism), *discourse of understanding* (interpretivism), *discourse of suspicion* (critical theory) and *discourse of vulnerability* (postmodernism, post-structuralism and deconstruction)[55]. While the origins of these discourses are diverse and interdisciplinary, they intersect in their concern for the social construction of self, other, and event (i.e., interaction and praxis), and in their acknowledgment of the researcher's role in establishing not only the research questions but also the research context. These discourses are systemic in nature and therefore try to stress the necessity of recognizing the impact of disparity that reigns social research, and thus identify the ways in which research inquiry creates meanings at the same time as it investigates them. Most importantly, they focus on instances of contact between individuals, the actual social transactions in which people engage and thus provide a plural theoretical apparatus for researching areas of human partnership and participation.

[55] According to Mumby the notion of discourse "is used here in Foucault's sense of a system of possibilities for the creation of knowledge".

Each of these discourses provides a distinct way of seeing the discursive and ethical dimensions of knowledge and thus situates and constructs communication and collaboration studies as a human participatory phenomenon within a polysemic context.

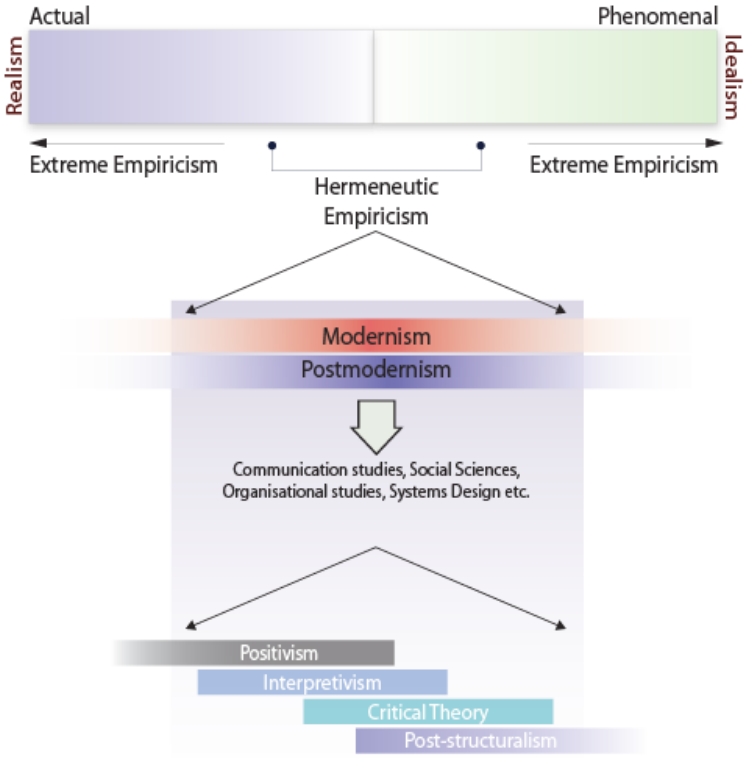

FIGURE 3-2 – HERMENEUTICS: POSITIVISM, INTERPRETIVISM CRITICAL THEORY, POST-STRUCTURALISM

Hence, we support that our meta-hermeneutic view towards an analysis of the human activity in communicational, organisational, social and technological contexts should place the object of inquiry within these four discourses and replace the habitual contrasting opposition between modern and postmodern. Briefly, the aim of this epistemological move is not to argue for standpoints that are sealed off from each other, but on the contrary, to offer an outlook position that considers the modern and postmodern as a continuum of mutually inclusive views; thus placing both notions (modern and postmodern) in an all-inclusive uncertainty, disposal and/or syndication.

Moreover, the terminology used for the analysis of these discourses primarily stems out of our ontological framework that is presented in the following sections {see §0}. With this in mind, we suggest that the reader should not consider this text as a 'readerly text', read in a sequential order with fixed meaning, but rather as a 'writerly' text where notions (e.g., communication, collaboration, creativity etc.) are used with multiple meanings without any posed teleological culmination. It is possible that notions in this section might seem ambiguous in the first reading and therefore a transgressive and regressive reading is suggested. Our stance aims to identify both

the undeconstructible condition of possibility that is posed in a lifeworld - similar to a mediated 'hall of mirrors' -, but also the inexorable condition of meaning production, of placing ourselves within the situation of analysis and decision making. The purpose is to intervene in an epistemological and practical way, to provide both questions and possible answers; not 'the ultimate' solutions, but merely justifiable arguments that fixate our thesis in a multitude of meanings where the reader is also responsible to excavate his/her own meaning related to his/her own symbolic horizon. The aim is to make elucidate the necessity of the contingent real, but also to provide an ontological device of representation that will attempt to put forward an actional creative means for understanding the context of human collaboration.

To set the stage, we pose that communication and collaboration, among other notions in the following analyses, are not considered uniformly, in all discourses, as the univocal notions of information transmission and purposeful cooperative activity, as seen in their positivist conception. Rather, communication is seen and compared with an interactive activity, always situated within an observed context, while collaboration is always (in)dependent to the purposeful character of consensual participation in cooperative actions. As a result, intentionality is an important characteristic of communicative and collaborative acts, but not the defining / causal quality that leads to the successful determination of the aforementioned terms (i.e., meaning closure). None would possibly deny that, for the most part, participants have particular intentions in mind when engaging in communicative activities. But we also argue that focusing on the intentional facet as the defining characteristic we might be close to fail in recognising that communicative and collaborative acts always occur within a diverse set of social contexts and are possibly defined independently of any intent that is produced among the participants (or the observers) in any currently observed network of analysis. Participants, thus, have intents precisely because they are always-already situated within, and are the affect/effect of/for, contextual discursive practices[56].

3.2.3 Positivism: Communication and Collaboration in the Discourse of Representation

Situated within the primary tendencies of the modernist thinking, positivist approaches (Cartesian dualism and the premodern dogmatic rationalism) marked out the *discourse of representation* where sciences had confidence on 'knowledge of truth'; the scientific methodism that separated the observer (researcher) from the observing (knowledge). In this context of extreme objectivism where language came

[56] This is a short introduction to the notions as presented in our theoretical framework and we suggest that the reader should refer to the relevant section {see §0} for further clarification.

to be the detached structural medium of representation of an ever motionless world, sciences that involved the ambiguity of the social where inadvertently marginalised. The radical split of the subjectivity (observer) from the object of analysis (observed) constructed a view that at best envisage communication and collaboration as a conduit or vehicle for already formed ideas. This mechanistic view of communicative and collaborative activities was mostly evident in the social and organisational settings where communication (including a view of it as a purposeful human activity) was conceived as simple expression or the vehicle of information transfer.

Thus in positivism, communication and collaboration are seen as neutral structural components of a sociocultural milieu. On the one hand, communication structures are responsible to define and maintain or augment already established discursive and political relations, while on the other hand, purposeful collaborative structures are evaluated, in terms of a utilitarian conception of cooperation were effectiveness, practicality and success for productivity are the guiding principles. Within this context of closure, certainty and control, collaborative consent and openness for democratic participation in decision making are undermined (Stewart, 1991, p. 356). Replaced by the *symbol postulate* (the idea that communication involves the transmission and reception of symbols), the *encoding postulate* (the idea that individuals codify cognition and represent it unaffected to others), the *interactional postulate* (the idea that communication is transactional) and the *fidelity postulate* (the idea that communicative activities are always apt among participants) language and human interaction are jeopardised to the unreflected conditions of the uncontaminated possibility of successful communication and consensual collaboration. Apparently, such an idea of describing communication and collaboration, where the notions themselves become structures that 'speak for' the situations over an existing set of already defined conditions, imperils the constitution of a pluralistic context where participants have the freedom and autonomy to interactively perform in a state of affairs that is defined in terms of environmental openness and conditions of undeconstructible possibility. The acts of communication and collaboration and the domain of the actual remain firmly separate while interaction at the interpersonal level is falling prey to self closure and inflexibility in terms of creative practice. Even thought late positivist conceptions try to cope with the critical questions that derive from the modernist and interpretivist traditions which follow the representational discourse, its ideological foundations impede the constitution of a new discursive paradigm for communication and collaboration.

What remains from the representational discourse for the understanding of communication and collaboration is the immense number of empirical research through representational tools that has been conducted for the study of a variety of topics. These tools (pen and paper test, questionnaires, etc) comprise an important set of useful methods to approach situations and to provide the structural apparatus for bottom-up investigation (for mode information regarding the tradition of representation consider the anti-representational critique, {see §5.3.4}.

3.2.4 Modernism and Interpretivism: Communication and Collaboration in the Discourse of Understanding

While the positivist discourse strive to maintain an essential bifurcation between subject and object as a means to knowledge apprehension and the interpretation of the real in terms of communicative and collaborative practice, interpretive modernism tries to provide the means of replacing this unexpected disconnection, if not by a reconciliation then by placing them in a dialectical tension. Thus the interpretivist manifestation of modernism derives from the positivist tradition, but expands its inquiry through the Kantian idealistic conception of the observer as an active contributor for the constitution of knowledge. Contemporary hermeneutics, pragmatism, symbolic interactionism and phenomenology of the twentieth century also contribute to its establishment in western tradition through the works of Gadamer (Gadamer, Weinsheimer, & Marshall, 2005), Heidegger (Heidegger, 1962; Heidegger & Krell, 1993), James (James, 1912), Mead and Morris (Mead & Morris, 1934), Husserl (Husserl, 1965, 1977, 1980), Merleau-Ponty (Merleau-Ponty, 2002), Peirce (Peirce, 1997; Peirce & Houser, 1992) and Wittgenstein (Wittgenstein, 1969). Common in these works is the rejection of the positivistic conceptions of the modernist era that misinterpreted, according to the aforementioned authors, the project of Enlightenment. The hegemony of metaphysical truth and rationality that were previously rooted in the transcendental foundational principles of positivist modernism are now systematically deconstructed by the interpretivist thinkers, and is claimed back from scientism and the instrumental reasoning of the humanist mind. Thus the focus of the interpretivist camp is to provide a new epistemological locus, where attention is shifted from the absolute truth of the representational mirroring that is provided by positivism, to an ontologically discursive conception of truth, knowledge and reality that emerge within the interactionist and social constructionist contexts.

Examples of this posture towards a theoretical basis for communication and purposeful action in the interpretivist modernism, include the linguistic turn that was epitomised in the work of Gadamer and his research in hermeneutics, language and its linguistic appearances (L. K. Schmidt, 2000) (Gadamer et al., 2005). For Gadamer the search for an absolute reality and ‘truth[,] eludes methodical man’ just because epistemological thinking is considered superior to ontology and thus ignores the extent to which knowledge is influenced by the linguistic habits that emerge in a social constructionist context. This dialogical being-in-the-world is also evident in the pragmatist interpretation of the post-Kantian and Peircean philosophies where human reality and science is always to be conceived through communicative

understanding and ultimately collective consensus (Apel, 1981, 1972). Along the same philosophical lines and towards the establishment of a discursive understanding of communication and collaboration within a societal context (i.e., Lifeworld[57]), several other modernists (Habermas, 1984, 1989, 2002) revitalised the visionary project of Enlightenment.

These ideas are particularly influential today in a number of fields including the study of society, politics, organisational analysis, and studies in partnership and participation. From these perspectives communication and collaboration are seen not simply as the characteristics that emerge out of human participation in collective groups of action, but also as constitutive forms for the establishment of communal behaviour. Thus community's existence is always tightly bound to the discursive practices that emerge through communicative and collaborative activities while simultaneously these activities of communication and collaboration are materialised, always, within the limits of a community's specific discourses. For organisation research, Mumby characteristically states:

> *"In my own field of organizational communication, the legacy of interpretivism is the emergence of "organizational culture" as a viable and widely adopted approach… to the study of organizing. From this perspective, communication is seen as constitutive of organizations. The study of stories, metaphors, rituals, and so forth, is a way to explore the ontology of organizing as a collective communicative act…" (Mumby, 1997, p. 7)*

But this ultimate need of the interpretivist conception of communication and collaboration studies for the constitution of a discipline was inevitably to fall short of expectations and to tautologise its own formation with the enactment of a conception of communication as a foundational ontology for human experience, in general. Thus, real and meaningful, is the result of a social constructionist project where linguistic construction and consensus-making are always characteristics of a shared horizon of postulations.

With interpretive modernism and its social constructionist stance, a variety of research methods are propound including, action research and participatory action research (Whyte, 1991), action learning (Revans, 1982), co-operative inquiry (Heron,

[57] "Edmund Husserl, first used this term in order to contrast the natural, pre-theoretical attitude of ordinary people to the world with the theoretical, objectifying, and mathematicizing perspective of natural science. Habermas does something similar. The lifeworld is his name for the informal and unmarketized domains of social life: family and household, culture, political life outside of organized parties, mass media, voluntary organizations, and so on …" (Finlayson, 2005, pp. 51-53)

1996), critical management theory (Alvesson & Deetz, 2000), organisational development and organisational change, development theory (Thomas, Chataway, Wuyts, & Wuyts, 1998) and ethnography (Prus, 1995) to mention a few.

Here the focus is the analysis of a variety of socially emergent qualities that originate from an ontologically observed combination of communicative events, identity properties, community characteristics etc. Applied in a diverse set of interdisciplinary contexts, related to anthropology and social sciences where personal characteristics partnership and participation as well as contextual properties are considered important, these methods include a variety of applications in education, organisational research, law, religion, systems design (i.e. for an in depth analysis of ethnographic methods see Brewer, 2000, pp. 10-26), information systems design (Avison & Fitzgerald, 2006) web information systems design (Vidgen, 2002) and lately collaborative systems design (Crabtree, 2003).

In sum, the social constructionist approach of the interpretive modernist era is focusing to provide a pluralistic representation of the socially constructed reality but inevitably is rooted on the individual observer's reasoning that is developed thought the continuous interaction within a network of socially communicative actions. This approach is critical to the instrumental rationality of the positivist modern discourse but in its place delivers a dialogic model of communication deeply depended on the pre-given consensual characteristics of a 'metaphysically' presupposed openness to genuine communication and will to communicate. Thus, such a perspective sees as necessary the directness towards an unconstrained discursive model of communicative act for the genuine construction of understanding and the consequent development of the community. What is marginalised and condoned is the intrinsic characteristic of every conversational context where dialectic contradictions play an integral role. In his critique of the interpretivist approach, Habermas (Habermas, 1970) clearly argues for the impossibility of pure meaning production through the dialectics of an uncontaminated conversation. For Habermas, the model that is proposed by Gadamer overlooks the ways in which dialogue can become "systematically distorted" (Habermas, 1990) through its enmeshment in structures of power and domination. Therefore the ideological turn that is proposed against the interpretivist discourse is focusing on a critical assessment its major omission and more specifically the ways in which communication and purposeful action are produced in antagonistic contexts.

3.2.5 Critical Modernism: Communication and Collaboration in the Discourse of Suspicion

Critical modernism inaugurates in the modernist tradition of interpretivism and focuses to provide an alternative to its logocentric speculations about the nature of communicative practices, while at the same time becomes a more radical version of

vitiation towards the claims of the representational paradigm, primarily because of its effective interrogation of the processes through which social reality is achieved.

Despite critical modernism's pursue for the basic beliefs of the social constructionist constitution of the meaningful, its characterisation as the discourse of suspicion (or neo-Marxism) is present primarily because of its critical stance against the essentialist views of the communicative practices that transpire in the interpretivist discourse of understanding and ignore the issues of power and ideology that exist in every antagonistic context, as well as other emergent properties (e.g., persuasion, control, alienation etc.) through which certain realities are privileged over others (Cheney, 1983).

Evidently, critical modernism also argues for a social constructionist view of the lifeworld but also acknowledge that superficial meanings systematically distort the realisation of a pure democratic social context where communicative activities and purposeful collaboration can be transformed to emancipatory means for the ultimate liberation of social beings. In this view, freedom is not to be won by the manifestation of new scientific methods (like in the representational discourse), but rather by careful examination of the socially constructed character of the symbolic systems that limit participant's / observer's ability to critically reflect on their conditions of existence. According to Mumby "Discourses of 'suspicion' make the assumption that surface level meanings and behaviours obscure deep structure conflicts, contradictions, and neuroses that systematically limit the possibilities for the realization of a genuinely democratic society." (Mumby, 1997, p. 9). He proposes that historically this focus has been manifested in two major streams of thought:

- The Western Marxist that presents the far-reaching critique of the un-dialectical, determinist nature of scientific Marxism and consequently proposes for a focus on the superstructural ideological dimensions of power (Gramsci, Hoare, & Nowell-Smith, 1971) (Volosinov, 2006) and
- The Frankfurt school which is seen as new ideological stance for the extension of the project of the Enlightenment and in particular the examination of systems of reason and rationality towards an improved understanding of the relations among epistemology, politics and capitalism.

The theoretical apparatus of critical modernism is at the same time critical to the positivistic reception of the ideas of the Enlightenment, but also affirmative to its utopian dream of ultimate freedom (or emancipation) through the understanding of the foundational relationships that underlie societal structures and their interactions. This is evident in the works of the three major proponents of critical modernism, Adorno & Horkheimer and later on Habermas.

In one of the founding essays of the Frankfurt School, the 'Traditional and critical theory', Horkheimer supports that 'traditional theory' should be interpreted as the

implicit or explicit outlook of the modern natural sciences, expressed in modern philosophy as positivism/empiricism (Horkheimer, 1972). Horkheimer is above all concerned with the diffusion of this conception of theory in the 'sciences of man and society [which] have attempted to follow the lead of the natural sciences (Bottomore, 2003). Therefore he proposes a new way of seeing the social, *critical theory*. Through this he rejects the procedure of determining objective facts with the aid of conceptual systems, from a purely external standpoint, and claims a social constructionist view of societal interaction in which:

> *'the facts, as they emerge [from the work of society], are not extrinsic in the same degree as they are for the savant…critical thinking…is motivated today by the effort really to transcend the tension and to abolish the opposition between the individual's purposefulness, spontaneity, and rationality, and those work-process relationships on which society is built' (Horkheimer, 1972)*

Later on, in the work of Adorno and Horkheimer (Adorno & Horkheimer, 1988) a more critical stance is evident against the positivist and interpretivist thinking of Enlightenment liberation[58]. Nevertheless, the work of the Frankfurt school, in general, has been characterised as an extension rather than a polemic to the Enlightenment project. Its final purpose is twofold: on the one hand it tries to preserve the links among reason, human emancipation and scientific positivism, while on the other it also tries to unveil how these relationships have been violently twisted and distorted by the "identity logic" and its focus to mastery and control. This is largely evident in the work of Habermas where his own critical modernist project of *communicative action* (Habermas, 1984, 1989), refocuses in providing a revitalised version of the emancipatory conception of critical modernism and Enlightenment[59]. His claim is that modernity's project is incomplete rather that obsolete (Bernstein, 1992, p. 208). Thus, his '*Theory of communicative action*' focuses to redefine rationality and social interaction in terms of a participatory conception of purposeful communication and collaboration. It is a theory of crisis permeated by the language of conflict and resolution; that is by the language of a dialectical logic that appears through communicational actions. Habermas provides a systematic investigation of how societal events and our view of the lifeworld have been overwhelmed by an

[58] In the 'Dialectic of Enlightenment', Adorno and Horkheimer characterise the Enlightenment's teleological ideas as disastrous (Adorno & Horkheimer, 1988, pp. 3-4).

[59] In extension Habermas also focuses in revitalising the project of Democracy and the norms of social critique. His primary aim is to develop a new basis for philosophy and social theory that he will ground on language and communication.

overarching and all-oppressing system of technical rationality (focusing on power and control). For Habermas the development of such a system consequent manipulation and domination that it imposes, amplify the decline of democracy and reason. In other words, the structure rationality that emerges from such a system impedes human participatory behaviour and overturns Enlightenment reason. In his analysis he identifies the forms of rationality evident in the Weberian ideas of rationalisation, and therefore proposes to *reconstruct* reason in terms of three forms of rationality that focus to show how communication functions "*both as the principal constitutive element in the move toward understanding and truth and as a means for the exercise of power and domination in society*" (Mumby, 1997, p. 11). These forms of Habermasian rationality include a *technical rationality* of the system, a *practical rationality* oriented towards reaching understanding and *emancipatory rationality* that operates beyond practical rationality, through dialogues among diverse stakeholders that produce not only practical results, but are also more likely to '*see beyond the accepted rationalizations in a society and the assumptions that interfere with insights*' (Booher & Innes, 2002).

Therefore, Habermas, driven by his vision to reconstruct reason and participatory democracy, he proposes us to rethink of 'what a live critical reason would be' and 'what a genuine political agenda must address'. Within this theoretical framework Habermas tries to generate the norms of critique. His argument is that language itself contains norms to criticise domination and oppression and constitutes a force that could ground and promote social democratic participation in the lifeworld. He suggests that in the capacity to understand the acts of another participant, to submit to the force of a better argument and to reach consensus, 'a rationality' that is inherent in language should be considered. This rationality is what he came to later call *communicative action,* a model of rationality that:

> *"could generate norms to criticize distortions of communication in processes of societal domination and manipulation and cultivate a process of rational discursive will-formation. Developing what he called an 'ideal speech situation,' Habermas thus cultivated quasi-transcendental grounds for social critique and a model for more democratic social communication and interaction" (Kellner, 2000, p. 259)*

He therefore suggests an alternative view of communicational interaction through the articulation of various *forms* of rational action[60] within language. These forms

[60] Basically Habermas categorises them in two fundamental types of action communicative action on the one hand, instrumental and strategic action on the other.

include *purposive-rational action, instrumental action, strategic action and communicative action.*

Purposive-rational action is oriented to ends, means, and secondary results. According to Habermas:

> *"The model of purposive-rational action takes as its point of departure the view that the actor is primarily oriented to attaining an end (which has been rendered sufficiently precise in terms of purposes), that he selects means that seem to him appropriate in the given situation, and that he calculates other foreseeable consequences of action as secondary conditions of success. The model of purposive-rational action takes as its point of departure the view that the actor is primarily oriented to attaining an end (which has been rendered sufficiently precise in terms of purposes), that he selects means that seem to him appropriate in the given situation, and that he calculates other foreseeable consequences of action as secondary conditions of success…" (Habermas, 1984, p. 285),*

As proposed by Habermas, this idea of success that is defined as a presentation of a desired state in the lifeworld can, in a specific situation, be causally produced either through a goal oriented action or by omission. The action that is oriented towards success is thus called *instrumental action* and is considered to occur under the prescription to the technical rules of action always in terms of its efficiency of intervention in complex situations. An action that is oriented to success is called *strategic action* when considered under the aspect of rules of rational choice and assessed in terms of the efficacy of influencing the decisions of a rational opponent. By contrast, *communicative action*s are considered the actions of the participants that "*are coordinated not through egocentric calculations of success but through acts of reaching understanding*". For Habermas communicative action is based on the mutual recognition of validity claims while its difference to the other types of action is its primary focus at securing understanding and consensus, while instrumental and strategic actions aim at practical success. Communicative action is the more fundamental because it is self-standing; instrumental and strategic action are not. As Habermas puts it:

> *"… communicative action participants are not primarily oriented to their own individual successes; they pursue their individual goals under the condition that they can harmonize their plans of action on the basis of common situation definitions. In this respect the negotiation of definitions of the situation is an essential element of*

the interpretive accomplishments required for communicative action."(Habermas, 1984, p. 286)

TABLE 3-1 – HABERMAS: TYPES OF ACTION

Action orientation / Action Situation	**Oriented to success**	**Oriented to reaching understanding**
Non-social	Instrumental action	-
Social	Strategic action	Communicative action

Therefore, the Habermasian project for the defence of modernity (Docherty, 1992, p. 103), still preserves the Enlightenment ideas of human emancipation, but it also provides a radically new analysis of communicative acts and social interaction compared to the preceding positivist and interpretivist version of modernism. Evidently, Habermas never attempts to disavow the modernist vision of human emancipation but instead tries hard throughout all his treatises to provide an alternative and critical conceptualisation of the instrumentalism. His ideas replace the fully-autonomous subject of humanism with an intersubjective and dialectical model of rationality. Hence he introduces a dialectical theoretical construct of approaching truth of knowledge and reality that is rooted in a model of communicative rationality and intersubjective understanding rather than absolute parallelism and representation. In this, everyday interrelationships among participants are constrained in a dichotomous model of interaction (subject-object, organisation-workers, government - citizens/voters etc). Thus Habermas perceives language, communication and collaboration as constitutive characteristics of human involvement within a socio-culturally expressed reality and thus articulates a theory of communication that is also a theory of society. A theory that tries to replace the subject-object hiatus with the subject-subject (or ego-alter, self-other) relationship.

While critical modernism, seen through of the contemporary conceptions of the Frankfurt school, tries to reconstruct the Enlightenment project with communication at the centre of its interest, a new, even more radical understanding of social interaction is attempting to further dismiss even the 'minor fragments' of metaphysical rationalisation that were left over primarily due to critical modernism's emancipatory beliefs. Postmodern and post-structuralist conceptions of communication and collaboration provide the '*final disdain*' for any metaphysically oriented understanding of the lifeworld and try to redefine human activity in terms of

a paradoxical understanding of identity, interaction, participation and the other characteristics of the personal and the public sphere.

3.2.6 Post-structuralism and Postmodernism: Communication and Collaboration in the Discourse of vulnerability

According to many authors there is not a clear differentiation of modern and postmodern. The latter signifies both the termination of the former and a differentiated continuation of it, or is considered as the latest stage of development of modernism (M. Power, 1990)(Best & Kellner, 1997)(Mumby, 1997). Post-structuralist and postmodern ideas are not alien to the views of modernism, but rather a means of broadening the conceptual apparatus of our understanding of human activity; including communicative and collaborative practices. Postmodern critique against any metaphysics can be seen to range from the affirmative to the radically sceptical (Rosenau, 1992) and deserves a close attention primarily in its ways of deconstructing all representational models of the past and secondarily because of the new perspectives that emerge from the 'distorted' and radically shifted understanding of a variety of notions and traditions of the past.

In order to clarify some of the most salient of these notions we have selected the following five categories for comparison. These include:

- Subjectivity and Identity
- Knowledge, Truth and Power
- Signification
- Society and Social-Cultural Change

3.2.6.1 Subjectivity and Identity

Besides the late critical modernist attempt to redefine reasoning and place it at the centre of its theory - by relating it in the accomplishments of a rational subject -, postmodern approaches criticise the idea of a coherent rational subject and (dis)place it among various discursive practices and dissipate knowledge structures. In postmodernism, the individual's desires are believed to be in a perpetual asynchronicity with any sociopolitical and sociocultural systems of (considered) domination while various discursive apparatuses that function to normalise and institutionalise subjectivity also engage in its definition. If 'individual's desire' for the modern thinker is territorialised (Deleuze & Guattari, 1987) or as Foucault puts it "*the desiring subject becomes a body of passivity and economic and political utility*" within the coordinates of a variety of dominant discourses that function in terms of symbolic abstraction at the sociocultural level, then for the postmodern thinker individual is seen as a 'The subject in process' (Kristeva, 1998) where the evolution of individuation and subjectivity is related to the evolution of language. Following the psychoanalytic theory of the Lacanian tradition the subject is by nature in motion.

This conception of 'mobility' challenges the erroneous notion of the monolithic nature of a structurally static language and characterises the creation of the subject, that departs from childhood through the '*mirror stage*'[61], in terms of an ever evolving language game.

Lacanian psychoanalysis represents the subject as a divided unity {see §5.2.3.1}, as a *dividual*, where the divisibility of the subject is conjoined to the lack that generates it. Postmodern theorization adds that the desiring subject is always inseparable from a context. There, desire can be conceived as an (*a)teleological* procession of differentiation and deferment, where the object of desire always eludes interpretation. As Lecercle puts it:

> *"desire can be conceived as a forward movement, a flight towards an object which always eludes our grasp, the attempt, never successful but never frustrating, to reach the unattainable by exploring the paths of the possible"(Lecercle, 1985, p. 196)*

Thus, postmodern desire in opposition to the modernist (some might think pessimist) view that defines it as a controlling mechanism, is only seen as responsible for change. It is a Nietzschean '*will to power*', a paradoxical notion that within the limits of language synthesises but also deconstructs meaning, a desire that never refers to a 'lack' (which would introduce a transcended element 'beyond' desire), but is just an intrinsic process that functions within a polyvocal network. To operate in such a context of subjectivity is to construct or fabricate a '*body without organs*' (Deleuze, 1990; Deleuze & Guattari, 1972, 1987); a schizophrenic experience of desire[62]; a subjectivity that sways among (or on the surface of) the Lacanian Imaginary, Symbolic and Real (Chiesa, 2007). Therefore, although some postmodernists tent to disavow the notion of the subject and decentre the individual to language (as in linguistics and semiotics), desire (as in psychoanalysis), or social processes (as in constructionism), the focus in postmodern scientific research remains on the individual as a vigorously creative and ethical subject that participates, constructs and is constructed because of his/her involvement in a social context.

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[61] Lacan supported the idea that the infant passes through the 'mirror stage', and thus acquires language, and gains a 'subject position' within society's signifying practices. This movement into the 'symbolic order' {see §5.2.3.1} makes subjectivity possible, but it also radically divides and alienates the subject from 'being', that is, from any unmediated consciousness (something that is lost since childhood) of body or psyche.

[62] Deleuze and Gauttari argue that schizophrenic experience oscillates between two poles. A first pole where organs are experienced to exhibit heterogeneous powers that enter into relation with each other and with external objects in a way that, taken together, they produce an individuated but non-personal multiplicity or 'assemblage' that functions together as a kind of 'machine'. At the second pole there lies the body without organs, a body deprived of organs in which the functioning of these organ-machines or assemblages is halted in a rigid catatonic stupor that can last for days or even years(Taylor, 2000, p. 39).

To summarise we provide a table [Table 3-2] that includes the key concepts that characterise the major issues that arise between the modern and postmodern conceptions of the subject.

TABLE 3-2 – MODERN AND POSTMODERN SUBJECT AND SUBJECTIVITY

modern subject	postmodern / post-structuralist subject
Centrered	Decentered
Individual	Dividual
Whole	Fragmented
Passive	Active
Homeostatic	Subject in process
Autonomous	Effect of the unconscious
Juridic subject	Subject of desire
Desire based on 'lack'	Productive desire
Rational	Irrational / pathos
Transparent / coherent	Polyvocal

3.2.6.2 Knowledge, Truth and Power

Postmodern thought focuses in redefining knowledge, truth and power and the ways these notions constitute reality. Although, modernists argue for a 'consensual model' in which knowledge, truth and power can emerge in coercive complex discursive contexts, postmodern views are opposing this idea. For the postmodernist, consensus is a logocentric metaphysical notion that constrains access to a dialogical and discursive mode of interpretation for knowledge, truth and power and eventually leads to totalizing discourses (or grand narratives)(Lyotard, 1984). The search for truth, an ostensibly discoverable 'logos', was replaced in modernity by the search for grand narratives; structures that exist in the symbolic level and can act in counter action to the Enlightenment's scientific knowledge that aim towards closure. Thus truth, knowledge and power cannot be seen instrumentally, as separate notions that can be tamed through the vision of a rational mind or a symbolic structure that

operates at the level of deductive logic. For the postmodernist knowledge is fragmented, truth is partial and never complete while power is implicated with truth in an ever shifting network of interactions. Foucault for instance proposes a model that does not seek to separate knowledge from power but rather envisions that knowledge and power are always interconnected. In his genealogical thinking, '*power-knowledge*' regimes demonstrate the ways that interpretation of what is considered dominant or marginal is related to '*games of truth*' that control the prospect of formulating knowledge claims at all (Foucault, 1972).

For the postmodern thinker knowledge is local, while dominating global expressions of knowledge subvert marginal voices that directly or indirectly influence the constitution of the sociocultural milieu. However additive these ideas might be, postmodernism does not consider these as subsumable under the auspices of one grand narrative. There is no palpable 'whole' that can be equal or even accumulatively greater that its parts, such an idea is considered to be unanswerable (Gödel, 1940)(Wittgenstein, 1993, p. 126)(Wittgenstein, 2006, pp. 46-47)[63]. For Wittgenstein one cannot 'escape' from a system without transcending the limits of meaning that are enacted by the system itself.

> *I cannot use language to get out of language. (Wittgenstein, 1980, p. 6/113)*

But Wittgenstein insists that there are intrinsic philosophical biases and limitations in our language which have to be overcome; though it is palpable that ontological holism (versus to logical holism) is inaccessible. This process of 'overcoming' does not mean that we are ever to achieve absolute knowledge but that is the only means to expand the limits of our language about it. The notion of absolute '*holism*' or any metaphysically transcended centre, collapses on the (its) inability to be symbolised. Similar to the resistance of absolute truth to be included in any symbolic chain, wholeness remains inaccessible. This locality of knowledge is escorted by a positional and a relational conception of 'power-knowledge' where standpoints are always situated in social relations and ideological constructions. As Maturana puts it "Everything that is said is said by an observer" and as Derrida would add, this observer is always-already within a context of elusive character. Knowledge, truth and power are not atomic units, nor structures that speak for the subjective minds.

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[63] It is interesting here to note that Wittgenstein criticised Gödel's original proof - in particular the fifth step. He argues that Gödel, according to Hilbert and Russell's symbolisms, in his fifth step, reinserts meta-mathematical declarations which are nothing more than a reframing of the initial expressions in a new notation system or a construct of a new way of thinking that opposes the previous. Thus Wittgenstein supports that it can be asserted that in none of these two cases the new expressions are related to the initial expressions.

To summarise we provide a table [Table 3-3] that includes some of the key concepts that characterise the major issues that arise between the modern and postmodern conceptions for knowledge, truth and power:

TABLE 3-3 – POSTMODERN KNOWLEDGE, TRUTH AND POWER

modern	postmodern / post-structuralist
Global	Local
Dominant	Marginal
Grand narratives	Metanarratives
Totalising	Fragmented
Purpose	Play
Create	Deconstruct
Synthesis	Antithesis
Deductive	Abductive
Closure	Incompleteness
Scientific knowledge	Narrative knowledge
Teleological	Non-teloelogical
Rational	Irrational / pathos
Transparent / coherent	Polyvocal
Axiom	Undecidable
Discourse of the master	Discourse of the analyst

3.2.6.3 Signification

Communication is often considered a form of *semiosis* which is concerned with the exchange of any messages (e.g., molecular code: immunological properties of cells, vocal sentences etc.). *Signification* is that aspect of semiosis which is concerned with the value or outcome of message exchange and is sometimes given the name '*meaning*', a word that is fraught with polysemy.

In the classical signification of the pro-modernist era, the solidity of the association between the signifier and the signified is preserved by the disappearance of the former {see first level of ontogeny, §5.3.1}. Here, meaning is meaning, there are no structural components, no signs that signify. On the other hand in modernist signification, as we have seen, attention is mainly fixed on the process of signification itself {see second level of ontogeny, §5.3.1}. The sign itself becomes the object of observation and throughout this process emerges an ontological interpretation of signs (compared to the ontology of the signified meaning). Whereas Peircean semiotics identified this shift in signification and its theorisation, structuralist semioticians like Saussure remained firmly attached to the primary ideas of the traditionalist era and sought to preserve the invariance of the link between the signifier and the signified. It is already mentioned {see §3.2.4} that interpretative and critical modernism problematises the notion of simple correspondence between signifier and signified. Both of these modernist approaches argue that there exists a structured language system that fabricates the Real.

Post-structuralist (and consequently postmodern) signification went one step further and considered the perpetual signification of the signifier as its primary concern. This major shift that characterises postmodern thinking demonstrated the destabilisation of any kind of 'static production of meaning' as equivalent to signification. For the postmodern thinker there is no such system of signification (i.e., language) that dominates. Rather there are only networks of interconnected discourses that develop what a modernist observer will call language (Derrida, 1976). Nonetheless, what postmodernism also identifies is that this observer is always-already situated within a network of discourses. His/her position is dialogically integrated within this network and thus he/she is already part of what develops him/her and in turn participates in the development of the network itself.

Therefore, signification is detached from deductive logic and turns toward abductive reasoning where major premises never achieve stability. The conception of *différance* deconstructs any primal (con)textual fixity and argues that meaning is never fully present in any context (meaning is constantly subject to slippage). Meaning is considered the product of a system of creative play that guides the formulation of tentative propositions; of a system of difference that is constantly deferred, free of any universal theoretical grounds. This conception, inherent in the beliefs of the postmodern turn, leads to what many of its critics attack as the 'hall of mirrors' effect, a failure to provide a ground to the challenge of radical self-reference primarily because its signification within an actual situation is strictly to what is *other*; an indefensible, perpetual reference to a new ever shifting signifier (Rosen, 2003). Therefore, whereas postmodernism relativises the monolithic enterprise of structuralism and modernism throughout the use of a radical model of recursion, it evidently fails to provide an account for the production of meaning with reference to a self, primarily because it ignores the involvement and possibility of simple identity (ontologically or not).

According to the late philosophical investigations meaning production, in terms of radical recursion, entails neither a model of perpetual reference to the *other* (external reference) nor pure reliance to *self-identity* (self-reference). Instead it is argued that radical recursion (or radical self-reference) that was the main objective of post-structuralist approaches, can be projected in theory and practice by a model of dialectical interplay between self-referentiality and externalism {see §0}.

To summarise we provide a table [Table 3-4] that includes the key concepts that characterise the major issues that arise in terms of the modern and postmodern conceptions for the process of signification:

TABLE 3-4 – POSTMODERN SIGNIFICATION

Modern	postmodern / post-structuralist
Relation of Signifier & Signified	Signifier to signifier
Self-reference	External reference
Grand narratives	Metanarratives
Referential text	Non referential text
Master text	Minor literature
Readerly text	Writerly text
Noun forms	Verb forms
Accurate interpretation	Myopic Misreading
Signification of Depth	Surface signification
Hierarchy	Anarchy

3.2.6.4 Society and Socio-cultural Change

Just as modern science undermines the simplistic causal models of Newtonian paradigm, so postmodern social science by drawing attention to the complexity, decenterdness and open-endedness of language, (con)texts, discursive formations, cultural identities, and so on, claims that the totalising fundamentalist biases that are inherent in traditional social theorisation, obscure semantic and cultural heterogeneity and thus, constrain reasoning to a teleological functionalism,

utilitarianism, structuralism and other similar conceptions of the social (Parsons, 1956a, 1956b, 1960)(Boje, Gephart, & Thatchenkery, 1995, p. 68).

In modernism social science is concerned with human beings interacting with one another in terms of mutually accepted standards of conduct but also identifies the complexity of these interactions and the impact of the environment's influence. Therefore, while for the traditional social thinker, structuralism and totalising theoretical constructs define the social in terms of homeostasis and equilibrium (Durkheim, 1963; Durkheim & Bellah, 1973; Durkheim, Coser, & Halls, 1984) (Luhmann, 1996), for the modern and postmodern social thinker, Habermasian communication theory, chaos theory, Gödel's theorem, mereology, quantum mechanics, Derridean deconstruction, Foucauldian power-knowledge and the Lacanian psychoanalytic model, to mention a few, provide the 'grounds' for interpreting social relationships.

Apparently, postmodern social theory found its basis by being critical to the modernist approaches and thus its theoretical grounds of society are also developed along the same lines. Investigating (and often privileging) instability and social disorder rather than order is the starting point while analysis of the diversification of social control and the transient behaviour of the social structures is based on the study of language and communication. This is seen from a perspective where '*far from equilibrium'* conditions are considered as the fact rather than the exception; and thus nonlinearity, change, chance, spontaneity, indeterminacy, irony and social fragmentation are observed as inherent properties of society, along with tendencies towards stabilisation and organisation.

Social constructivism in modernism has been used to represent mental phenomena and their generation through social relations while social representation theory (Farr & Moscovici, 1984; Moscovici, 2001) emphasised on mental representations and how these construct reality. In contrast, social constructionism (a postmodern approach) has distinguished itself by giving discourse a central role for the construction of the social context (Gergen, 1999, 1994). Characteristically, Gergen highlights some of the basic assumptions that are to be found in any social constructionist approach:

- The terms used to describe subjectivity and the lifeworld are not dictated by the parts that constitute this 'reality'.
- The terms that give ideas about the constitution of the 'real' and the subjective are social artefacts that are produced over historical time through the exchanges between people; who interact within cultures.
- Social processes are those that define any interpretation of the subjective and the objective validity of 'what is' and 'what is not' actual.
- Language influence social actors and their interactions but is also defined because of their involvement in social relations.

In postmodernism, the static societal structures of modernity and their functioning are replaced by '*dissipative social structures*' that offer a model of stability which does not ignore the importance of an ever shifting environment (a horizon of meanings). This is a flexible way of describing the configuration of the societal structures and implies relative stability (order) and perpetually unpredictable change (disorder), at once. The functioning of the variety of societal structures and their environment is not described in terms of information exchange or any other type of hierarchical interaction. Instead it is believed to be enacted by what Maturana and Varela and later Luhmann, in terms of social analysis, called '*structural coupling*' (Maturana & Varela, 1992)(Luhmann et al., 2004). Structural coupling functions among a wide variety of coexisting (relatively to their horizon) sites of determinants whose articulation in time can never be precisely predicted; primarily because their inherent uncertain nature produces unpredictable instances. The functioning of structural coupling is employed by Luhmann, as an anticipatory model, to define the ways in which the system's structure develops to presuppose or expect that certain perturbations[64] will occur in its environment (Luhmann, 1992). These perturbations are not actual entities firmly defined in the environment, but instead are observed / determined by the system itself (systems that includes the observatory mechanism). In the case of social interaction, this type of structural coupling will be expressed by the particular expectations of communicative and collaborative activities.

Both modern and postmodern theoretical views are in agreement that contemporary culture, society, and social change are best described in terms of fragmentation, conflicting situations and contradictions of disorder. But modern theory tries to discover an attainably resolvable end that will provide grounds for the creation of societal harmony, while postmodern theorisation 'legitimises' the fragmentary nature of society and its intrinsic lawlessness; it also intends to focus on locality towards analysis of social change and problem-solving. As we have presented in the previous section {see §3.2.6}, in breaking with the assumptions of the classical theory of representation, both modernism and postmodernism move toward a pragmatic theorisation of truth, knowledge and the social.

Nevertheless, postmodern approaches are also fragmented and diverse themselves. On their radical formations (Baudrillard, 1989, 1994)(Feyerabend, 1993) these theorizations often implode and generate nihilism and despair about the possibility of mapping an increasingly complex and abstract social world (Best & Kellner, 1997, p. 264) while the eco-socially oriented theoretical developments support ecology as

[64] Or '*irritations*' in Luhmann's terminology.

central to postmodern scientific (re)thinking (Prigogine & Stengers, 1984) (D. R. Griffin, 1988, 2007). Thus, within postmodern social thinking two strands can be identified, the *scientific* and the *eco-socially* influenced.

In terms of the radical postmodern theoretical formations, social science deprives any positive, ethical or ecological values from the societal entropic character and disconnects it from the recursive notions of autopoiesis and self-organisation. Here postmodern developments (i.e entropy theory, chaos theory etc) have important implications in terms of theoretical and practical sciences (i.e., medicine) but also in everyday practical use of technologies. Conversely, those who privilege ecology of mind, society and nature, see one of the key tasks of postmodern science (including social science) to comply with the fusion of previous oppositional theorisations among human, society and nature. They support that postmodern science can take a non-exploitative relationship by the implementation of a naturalistic epistemological thinking or what they characteristically call '*reenchantment of nature*'. Their purpose is to develop a '*new dialogue*' among the human, the collective and the natural environment, which like the critical modernist approaches, provides a passage to the '*universal message of science*' and truth (Prigogine & Stengers, 1984). What they do not explain is the meaning of this 'reenchantment', how 'universal message' is to be interpreted and what are the ways of accomplishing it. They avoid discussing the social changes that are needed to change both scientific thinking and social interaction and thus "*mystify the extent to which science is still thoroughly implicated* [for instance] *in repressive social* […] *policies*" (Best & Kellner, 1997, p. 267). Moreover, eco-metaphysicians (Rifkin & Howard, 1989, p. 291) in the name of undifferentiated wholeness (nature's autonomy), privilege natural laws while at the same time relegate social interaction and individual personal characteristics. These new-age conservatives undermine the potential influence of an individual's interactions with his/her environment and simultaneously obscure the social inequities that emerge from social contact. What both strands do not realise is that scientific development, social contact and our relationship with the natural environment has to be understood in terms of a social and historical mediation. Nature, lifeworld and individuality are to be seen as historical constructs, surface events {see §5.3}, rather as stable (con)texts.

At this point we identify that while many modern social theorists favour social stability and consensus as the ultimate end, postmodern theorists emphasise on the constitution and the analysis of a higher order language, discourse and signification as ideals of meaning that are detached from any relations to the social and the natural[65]. Postmodern ideas are beneficial in providing awareness of our enmeshment in

[65] See for example the Habermasian and Derridean approaches.

technological, social and semiotic systems, but, unlike the critical ideas of the Frankfurt school, they fail to analyse human embeddedness with the natural. Although many progenitors of the postmodern social science paid special attention on the influence and the correlation of the social and the natural, many radical postmodernists ignored these ideas and focused on marginal deconstructions and ultimate reductions to humanism and the social. Best and Kellner argue that:

> *"While the postmodern critique to humanism could be easily applied to an understanding of the psychological and social dynamics informing anthropocentrism, this move has not been made by any leading postmodern social theorists. No major postmodern philosopher or social theorist, in other words, has explored the connections between the deification of the Western rational self, the alienation from the natural world, and the modern project of the domination of nature." (Best & Kellner, 1997, p. 269)*

Thus, critical analysis of epistemological developments - the social and cultural changes that take place in parallel and the restructuring of our observing as analysts of our own developments and social interactions - can contribute to the development of a pluralistic critical theory. The aim of a social theory based on both modern and postmodern ideologies is to avoid marginalisation of counterparts while at the same time disavow the centeredness of a correlationalist, middle ground, critique {see §5.2.6}. The "defects" that arise from the postmodern rejection of influential tenets of modern social theory, such as the attempt to grasp systemic relations in society, ground social critique in normative assumptions or to transform society along emancipatory lines, should be seen as accounts to be inclusively tackled rather than targets for renouncement.

Evidently many of the current trends in postmodern analysis and critique of the social, draw out the implications for social reform from the work of Freire who situates his analysis between the modern and postmodern (Freire, 1985). Amplified by the theoretical apparatus of the Lacanian analysis of the subject {see §5.2.3} that situates it at the midst of a societal evolutionary process, modern and postmodern thinking can be reconciled to a non fatalist and non nihilist paradigm that has confidence to a paradoxical conception of the organisation of reality. An attempt to provide such a theoretical framework is outlined in our analysis of the critical meta-hermeneutic (de)constructive ontology {see §5.3}.

To summarise we provide a table [Table 3-5] that includes the key concepts that characterise the major issues that arise in terms of the modern and postmodern conceptions of society and socio-cultural change:

TABLE 3-5-POSTMODERN SOCIETY AND SOCIO-CULTURAL CHANGE

modern	postmodern / post-structuralist
Societal equilibrium	Far from equilibrium conditions
History and progress	Deconstruction and reconstruction
Reduction of social complexity	Proliferation of complexity
Stable premises for action	Premises of action based on tolerance
Homeostasis	Change
Order	Chance
Consensus	Consent, Irony & play
Formal closure	Open endedness
Foundational politics	Anti-foundationalism
Homogeneity and Normativity	Diversity
Hierarchy	Anarchy
Totalities	Dissipative structures
Structural functionalism	Structural dislocations and undecidability
Predictability	Unpredictability
Structural determination	Deconstructive and reconstructive perpetual re-presentation

4 Understanding Interaction in terms of Communication and Collaboration

Interaction in this thesis is considered a social activity that takes place within socio-cultural and socio-technical networks, where individuals participate in a social systemic web of meaning production. Therefore, interaction is not to be seen as the interfacing between human beings and artefacts, but as a collective activity that occurs in-between individual entities (either human or non human) that confluence themselves by participating in a context. Historically, this process has been thoroughly examined by a number of theories of communication and collaboration, which in turn we will study in this chapter.

Communication and collaboration theories are influenced by a wide range of ideas deriving primarily from the current status of new-age practical, theoretical and philosophical viewpoints, but at the same time these ideas recursively feed-back for the constitution of new practices, theories and philosophies. Nevertheless, and despite the ancient roots and growing profusion of theories about communication and collaboration, we argue that communication and collaboration theories constitute a field of study that does not yet exist as a concrete system of thought (R. Craig, 1999). Thus, while communication and collaboration theories play an important role for the development of the contemporary intellectual status quo, it is hard (and may be impossible) to define them as a concrete scientific field; although many disciplinary traditions, methodologies and schools of thought try to describe them as such. To overcome this logical 'barrier' or paradoxicality (R. Craig, 1993) that appears primarily because of the complexity and pervasiveness (or embeddedness) of the notions of interaction, communication and collaboration with other disciplines[66], we choose to follow a path of in-betweening that focuses on an analysis of the separate (contrasting or converging) domains (or expressions) of scientific thinking that these notions appear to conform. Thus communication and collaboration theories in this

[66] The overall transformation of the human sciences that clarifies both the recent development of communication theory as well as our present density of ideas about theory in general, is named by Geertz in his famous essay "Blurred Genres" (Geertz, 1985, pp. 19-35). Geertz indicates the fuzziness of the formerly clear boundary between the social sciences and the humanities and emphasised on the scientific turn of the humanities. Characteristically he states that scholars in many disciplines "*have become free to shape their work in terms of its necessities rather than received ideas as to what they ought or ought not to be doing*". And as Craig argues "*Interdisciplinary theory in the humanities now engages philosophy, social theory, rhetoric, and cultural studies as well as literary and artistic critical theory in a common, though heterogeneous, discourse. Through this interdisciplinary discourse, strands of postmodernism, deconstruction, reader response theory, historicism, feminism, Marxism, psychoanalysis, and so forth, emerge, split, recombine, and spread across disciplines and continents.*" (R. Craig, 1993)

view can constitute a quasi-coherent field of metadiscursive practice, a field of discourse about discourse with implications for the practice of both communicative and collaborative activities.

Guided by the necessity to move towards an exploration of a theoretical framework for describing communication and collaboration in terms of collaborative systems-design practice, we need an organising scheme for looking at the variety of theories available in literature. With this in mind, and in order to be able to make a comparison of the existing theoretical traditions, we make use Craig's analysis[67] which reconstructs communication theory as a dialogical-dialectical field. This analysis described according to two principles: the constitutive model of communication as a meta-model (a model of models) and theory as a metadiscursive[68] practice (R. Craig, 1999). This provides a robust system for ordering communication and collaboration theories in a comprehensive way (Littlejohn, 2007, p. 34). Accordingly, Craig divides the world of communication theory into seven traditions: Semiotic, Phenomenological, Cybernetic, Sociopsychological, Sociocultural, Critical and Rhetorical. These are considered scholarly communities drawn together by similar assumptions about communication and collaboration. In many cases these traditions are in opposition among each other while in many other are complementary. In line with Littlejohn's apprehension of Craig's categorisation we support that these traditions, as a group, provide sufficient coherence to allow us to look at and compare theoretical constructs by providing the means to identify their essential commonalities and differences. In the following section we present an overview of each of these traditions.

[67] Another similar metamodel has been presented by (Anderson, 1996, pp. 36-42). In this thesis we will make use of Craig's model but we will also include ideas that stem out of Anderson's analysis.

[68] Craig characteristically states in defining metadiscourse: "In a practical discipline of communication, theory is designed to provide conceptual resources for reflecting on communication problems. It does this by theorising (conceptually reconstructing) communicative practices within relatively abstract, explicitly reasoned, normative idealizations of communication. Communication can be theorized, of course, from many different perspectives, so the field of communication theory becomes a forum in which to discuss the relative merits of alternative practical theories. This discussion about alternative theories constitutes what I am calling theoretical metadiscourse."

4.1 Semiotic Representationalism in Communication and Collaboration – Intersubjective Mediation by Signs

Semiotics is the study of signs[69] and is considered an important tradition of thought in theories of communication, collaboration and systems-design. The study of signs not only provides a way of looking at communication and its related fields of epistemic inquiry, but also has a powerful impact on almost all perspectives now employed in the sciences that involve some kind of agency (evolved or human constructed). Most of the notions described in this thesis are also seen as correlates to the domain of semiotics. So before describing the details of our framework of (de)constructive epistemology, it is important to analyse and characterise the power and constraints the different models of signs make available within semiotics.

Semiotic approaches (including semiotics and semiology) are nowadays considered the scientific domains that study the phenomena of signification, meaning, and communication in natural and artificial systems (Nöth, 1995). The philosophers that defined, organised and structured semiotics[70] as a research area are Saussure and Peirce while many others contributed during the 20th century with different but agnate approaches; namely, Eco, Greimas, Jakobson, Hjelmslev, Merrell, Morris, Sebeok and others.

As an epistemic tool, semiotics can assist in modelling both natural and artificial systems but always with constraints depending on the nature of the system at hand. For natural systems, i.e., systems that already can be observed in our ontic environment, semiotics can assist in their analysis rather than their synthesis (in terms of our current knowledge). For artificially constructed systems, semiotic modelling can be fully applied both in terms of semiotic synthesis and semiotic analysis. Semiotic processes and products (i.e., semiotic systems) are produced by semiotic synthesis (no metaphysics involved in the process) while the employment of semiotic analysis offers an evaluative mechanism of understanding the artefacts of our creation.

The main *quasi*-structural component of semiotic approaches is the *sign* while the purpose is to explain different kinds of phenomena as being *sign processes*. The

[69] Saussure preferred to use the term *sign* over the term *symbol,* primarily because he believed that the latter implies motivation; unnecessary to the arbitrariness of the meaning of the sign.

[70] Saussure and the European school of linguistics and sign studies used the term *semiology* as opposed to *semiotics* that was primarily associated with the American school. Today the term semiotics is used as the general designation for the analysis of all sign systems.

dyadic sign, as proposed by the structuralists of the 19th and 20th centuries, is presented as two planes [Figure 4-1], bi-univocally connected (Eco, 1979):

- Expression plane
- Content plane

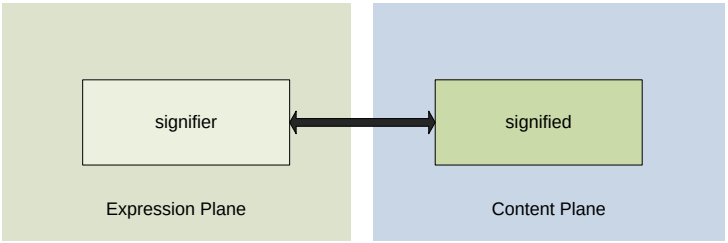

FIGURE 4-1 - STRUCTURALIST'S MODEL OF THE SIGN

On the expression plane we find the discriminable entities that are defined as signifiers, while on the content plane we find the signifieds. In the structuralist conception of semiotics, signifiers and signifieds are considered mental units, related to each other - connected - as dyadic pairs (Cartesian pairs) which consequently are named signs. This model inaugurates in the work of Saussure (Saussure, 2006) and has been further developed by Hjelmslev (Hjelmslev, 1970) and others. According to the structuralist model, both signifier and signified were supposed to be mental units. An example of a signifier would be the sound of the word 'tree', defined on an expression plane of sound waves, encoded accordingly to become a mental term, and its signified will be the idea individuals have of a tree, also encoded in a mental way [Figure 4-2].

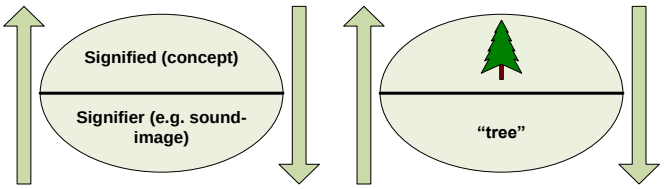

FIGURE 4-2 - STRUCTURALIST'S MODEL OF THE SIGN

As such, a sign - for instance, a spoken word - gets its meaning only in comparison (in relation or in contrast to) to other signs always within a system of signification where other signs coexist and develop it[71]. The signifier and the signified are the structural

[71] In the Saussurean model, signs can exist only in opposition to other signs. In other words, signs are developed due to their relationships with other signs.

elements of a complete sign which is formed by an associative linking bond[72] between the two (signifier and signified). The contrasts at the syntactic and semantic level that are formed between signs of the same class in a network of relationships, provides the ways signs derive their meaning.

Clearly, structuralists believe that the process of communication through language involves the transfer of the contents of minds [Image 4-1]. Consequently signs make up the code of the circuit between the participants that engage in communication and its purpose is to reveal the contents of the mental activity of each other.

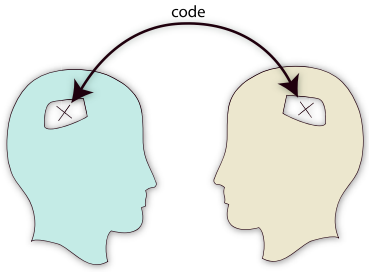

IMAGE 4-1 - STRUCTURALIST BOND BETWEEN SIGNIFIER AND SIGNIFIED

In fact, Saussurean understanding of the linguistic sign is related to an 'arbitrary nature' of the bond between the signifier and the signified. Hence there is no natural reason why the signifier 'tree' should be engendered the signified, the connection between e.g., the illocutionary act (sound) of 'tree' and the actual tree is considered arbitrary.

The problem with this approach was later found in its binarism where the sign that exists in the mental world has an equivalent object in an external world and the consequent communicative arbitrariness. Heavily used in linguistics, cognitivism and artificial intelligence this totally arbitrary connection between the signifier and the signified and the logocentric privileging of the one side over the other (e.g., speech over writing, presence over absence, identity over difference, meaning over meaninglessness etc.), has apparently been identified as the weak point of the structuralist model of sings. This inability of structuralism to describe and amplify the paradoxical nature of sign and sign systems has been evident in the critiques of many post-structuralists (Derrida, 1976, 2001, 1973), including logic and cognitive scientists

[72] Apart from the structural dualism (signifier-signified), this "link", or the process of signification, and its existence/development is another weak point of the Saussurean structuralist theory. It has been attacked by many post-structuralists.

(e.g., the symbol grounding problem) (Harnad, 1990) as well as systems designers (Coyne, 1995)(Truex, Baskerville, & Travis, 2000)(Liu, 2000).

The American school of semiotics is based on the ideas of Charles Saunders Peirce and follows the idea of a triadic model of meaning which asserts that meaning arises from the relationship of three components: the Referent, the Interpretant and the Sign (the sign as a constituent part of an indivisible triad). In this model, the Saussurean signified is split into two different parts. The first is the 'object' of the sign that is connected to an element of the real world and the second is the 'interpretant' of the sign that is related to the effect of the sign on the mind of a potential interpreter [Figure 4-3].

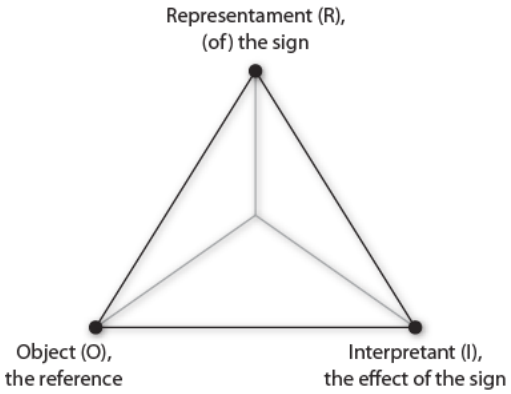

FIGURE 4-3 - TRIADIC MODEL OF THE SIGN

According to Peirce (Peirce, 1997)(Nöth, 1995), a sign is an ideological construct which under certain modes of communicative activity represents meaning to communication participants. Interpreted signs (interpretants or meanings) are represented in the minds of participants as secondary signs, comparable to the originating signs. In the triadic mode of semiosis, it is considered that both sign and interpretant refer to exactly the same object. As a result, in the process of meaning development, the object, by means of its relation to the sign, confers to the sign the ability to represent it. This ability is consolidated during the generation of the interpretant, within the mind of a potentially existing interpreter. For example the word 'tree' is associated in the mind with a certain type of plant. The word itself is not the plant, but is instead the thoughts, associations, or interpretations that connect the word with the actual object for the agent doing the interpretation. As a result, different personalities will experience the sign 'tree' differently [Figure 4-4].

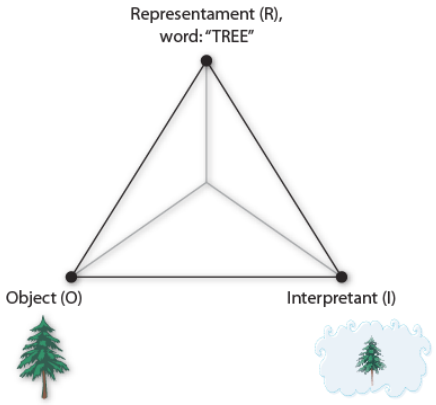

FIGURE 4-4 - TRIADIC MODEL OF THE SIGN 'TREE'

Compared to the Saussurean model, the triadic conception of the sign does not connect automatically the signifier to the signified. There exists a process that relates the two, the process of semiosis. In short, this is a highly cyclic relationship: a sign only turns into a sign, when it possess the capacity of generating an interpretant, and it will only have this capacity, in virtue of the relation that it has with its object (Chandler, 2004).

Peirce also devoted his research in analysing the different relationships within the triadic model. Specifically at what levels of interaction, semiosis occurs. These relationships (or levels), namely, syntactics semantics and pragmatics, have also been thoroughly explained by Morris in his Foundations of the Theory of Signs (Morris, 1938). In particular syntactics (or syntax) is the formal, structural, relations between signs [Figure 4-5]. This analysis of the physical composition of signs makes clear that signs never stand by themselves but are always part of a larger sign system or symbolic chain. Signs are organised in particular ways and always understood in relation to other signs. Therefore, syntactics refers to the rules by which communication participants combine signs into complex systems of meaning.

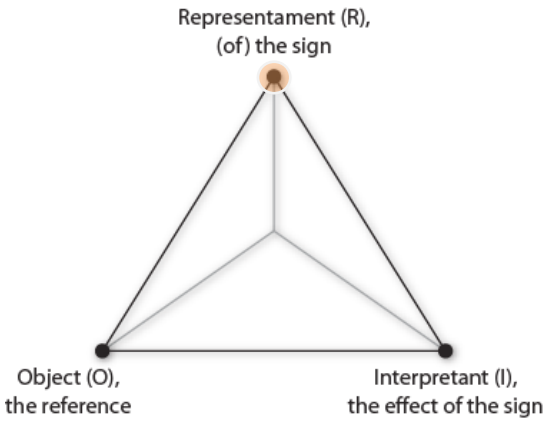

FIGURE 4-5 - SYNTACTICS

Semantics (or meaning) addresses the relation between an object and that which represents it [Figure 4-6]. In other words, it denotes the sign's referential meaning: what does the sign represents (a sign denotes a denotatum), or what meanings does a sign bring to the minds of the participants in a specific situation.

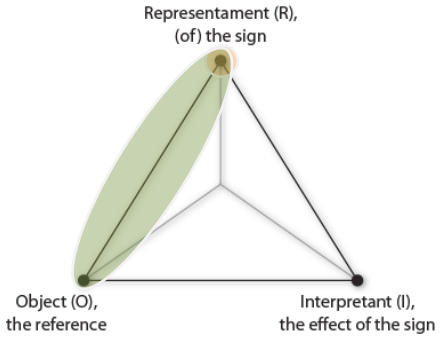

FIGURE 4-6 - SEMANTICS

Taken within the structuralist tradition, this obviously represents a limited definition of meaning where 'reality' is assumed to be equivalent to the mappings of signs. Following this, constructionism is described in simplistic terms with easily definable boundaries and often relies on the pre-existence of social consensus. Meaning is treated as a 'logic function' that maps signs to 'reality'. Post-structuralist approaches that aim to deconstruct the rigidity of static semantic meaning, similar to Peirce's conception of the semantic level, proved the erroneous nature of this belief. According to them, once semantic consensus is established it soon is a subject to question and criticism. Meaning in this respect is more appropriately considered as a linking mechanism between sign and sign's communicative action/behaviour. As such, signs at Peirce's semantic level have their very own sign behaviour, their self-referential means for self-production (Morris, 1955). Accordingly Liu states:

> *"meaning of a sign relates to the response the sign elicits in a given social setting. It signifies any and all phases of sign process (the status of being a sign, the interpretant, the fact of denoting the significatum), and frequently suggests mental and valuational processes as well. … Meaning in this sense is a result of the use of signs, and is constructed, constantly tested and repaired through the use of signs" (Liu, 2000, p. 30).*

The sign's functions, at the semantic and pragmatic (follows next) levels (in terms of communicative acts), are also closely related to the social impact that sign systems have to the way 'reality' is constructed. Thus, the first thing that communication participants focus on when using signs, is to express meaning while the ultimate goal is to influence the social or to alter the state of affairs. Hence, meaning, at the social level is building progressively while the fulfilment of objectives at one level becomes the basis for the subsequent.

Pragmatics is the third major semiotic level that refers to the functional relation between signs and the communicating participants; how the individual interprets the sign [Figure 4-7]. It is the purposeful use of signs within a social community where common knowledge and shared assumptions (pragmatic information) are supposed to structure the minimum basis for communication.

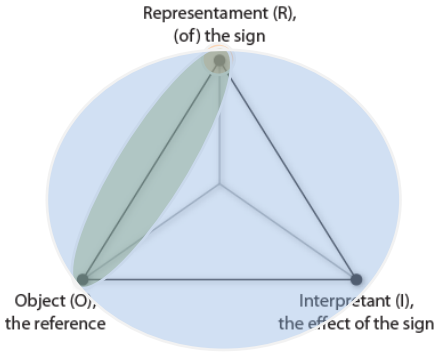

FIGURE 4-7 - PRAGMATICS

This level of semiosis is considered to have the most important impact in communication and collaboration theoretical foundations as signs and in extent sign systems are seen as the structural elements for any communicative action. This means that for meaningful communication and collaboration, participating individuals should also be aware of the contextual aspects of sign usage (e.g., syntactic, semantic, societal, cultural etc.). Certainly this does not mean that specific meanings are produced about the 'real', but it provides a flexible framework upon which collaborators are able to test their contextual awareness. Meaning at the pragmatic level is paradoxical. Within this web of signification that sign usage produces, meaning is both individualised and socially shared, both subjective and objective.

As shown, these three levels of the Peircean model (syntactics, semantics and pragmatics) are interdependent and act in a relational fashion while the action that contains them to a particular referentiality is considered to be constitutive (D. G. Ellis, 1991). A semiotic system never exists in parts but is always a paradoxically constructed spectral 'whole'. The distinction to levels is not to be thought as futile. Like other traditions, it gives us a new intellectual method for understanding the different aspects of meaning creation and in extent it provides a new approach of constructing 'reality'.

4.2 Phenomenology in Communication and Collaboration – The Experience of Otherness

Phenomenology, in general, is the study of essential structures consciousness as experienced from the first-person point of view or the examination of *phenomena* that which appears to consciousness. It is considered a version of Cartesianism[73] which includes a strong emphasis on subjectivity (Solomon, 2001). The phenomenological tradition inaugurates in the works of three major philosophers Hegel, Husserl and Heidegger[74].

A common characteristic of phenomenologists is their aim to provide a theoretical framework that will explain the way (human) beings experience their lifeworld; to justify cognition (Crowell, 2001), or *evidenz: "the pure viewing and grasping of something objective directly and in itself"* in Husserl's own words (Husserl, 1980). Thus it can be said that phenomenology seeks to explicate the awareness of human experience by moving from an explanation of the experienced, to a simplification of the experiencing to its elements, towards an interpretation of the experienced (Lanigan, 1992). In other words phenomenology is the philosophy of knowing through direct experience.

In the Hegelian conception of early phenomenology (dialectical phenomenology) it is knowledge that is considered important. Hence, knowledge for Hegel is seen as an exploration of phenomena or, as a means to teleologicaly conceive the absolute *Real*. Dialectical phenomenology relates to an ontological and metaphysical spirit that unquestionably exists behind all phenomena. For Husserl phenomenology is more than a metaphysical conception of knowledge. Husserl relativises the Hegelian notion of knowledge and thus he refers to phenomenology as a reflective activity of the essence of consciousness as experienced from a subjective agent; or how acts of consciousness relate to objects of consciousness. For Husserl there is no direct link to an absolute reality but only an intuitive experience of phenomena. A *phenomenon* (or the appearances of the lifeworld e.g., events, conditions or objects-in-space-before-subject) is the starting point from which subjectivity tries to extract the essential features of experiences and the essence of what is experienced. Thus, phenomenology for Husserl is the way in which subjectivities come to interpret a pre-existing -but not preconfigured or determined- world. It is the method that sees

[73] Husserl himself considers the method of the Cartesian doubt as an important prerequisite for describing the method of phenomenology (Husserl, 1980). In particular he describes three stages: 1. Adopting the Cartesian doubt, 2. Phenomenological reduction by the Cartesian Cogitatio, 3. Distinction between "appearance and that which appears".

[74] including Sartre, Blanchot, Levinas, Gadamer, Merleau-Ponty, Ingarden, Gurwitsch among others.

actual lived experience as the basic data of reality, or in the words of phenomenologist Merleau-Ponty:

> *"I am not the outcome or the meeting-point of numerous causal agencies which determine my bodily or psychological make-up. I cannot conceive myself as nothing but a bit of the world, a mere object of biological, psychological or sociological investigation. I cannot shut myself up within the realm of science. All my knowledge of the world, even my scientific knowledge, is gained from my own particular point of view, or from some experience of the world without which the symbols of science would be meaningless… I am the absolute source, my existence does not stem from my antecedents, from my physical and social environment; instead it moves out towards them and sustains them, for I alone bring into being for myself..."(Merleau-Ponty, 2002, pp. preface, viii)*

Therefore, while Husserl's phenomenology gives great emphasis in the immediacy of experience - an attempt to isolate experience and set it off from all assumptions of existence or causal influence and lay bare its essential structure - it also restricts our attention to the purity of the information that derives from consciousness. This is to be thought as a second order experience that is pure and uncontaminated by metaphysical theories or scientific, or even myopic, assumptions. This is exactly the weak point of phenomenology that Merleau-Ponty, Heidegger[75], Derrida[76] and others

[75] In contrast to Husserl's phenomenological method nowadays most phenomenologists believe that experience is subjective, not objective, but they consider subjectivity as an important kind of knowledge in its own right. Examples of this reaction against Husserl's objectivist view are the *phenomenology of perception* as described by Merleau-Ponty (Merleau-Ponty, 2002) and the *hermeneutic phenomenology* of Martin Heidegger (Heidegger, 1962) (analysed in text).

[76] While Husserl maintains the ambition of suspending "the natural attitude", of doing away with all presuppositions to consider phenomenon as it gives itself in person to consciousness, Derrida shows that this ambition is not realised in Husserl's work (Derrida, 1973). Husserl depends on the interrelated presence of the object to the self-present subject, on the guarantee that presence provides of evidential force. Derrida's argument that Husserl's phenomenology is essentially metaphysical relies on two problems related to the question of presence: time and language. Regarding time Derrida argues that the perfect presence to consciousness of the indented object, which Husserl requires to meet the conditions of Evidenz, is inevitably undone by the fact that presentation involves the temporally divisive movements of re-presentation and a-presentation. What is supposedly present to consciousness is never actually present, but slightly "out of sync" with the reflection that must always follow or anticipate it. Language on the other hand reflects not full presence, but a play of presence and absence: language operates as an infinite network of references that cannot be held at bay. This infinite play is implicated in Derrida's notion of différance where the condition of possibility for meaning is also the condition of impossibility for determinate meaning. A meaningful sign can always be repeated in a different context and because its meaning can always be deferred. For this reason absolute meaning for Derrida is *undecidable* (Horner, 2001, p. 25). It is evident that Derrida does not

aimed to overturn by attacking it either from within or from the outside of the phenomenological tradition.

The first critique of the Husserlian phenomenology was from Martin Heidegger who believed that Husserl's phenomenological approach overlooked the relationship between object and subject (Heidegger, 1962). Particularly, he tried to expand phenomenological investigation to encompass our understanding of Being itself (*hermeneutic phenomenology*), thus transforming the method of phenomenology to an ontological method of studying being (ontology)(Heidegger, 1988){see §5.3.1}. Heidegger notes that the purpose of phenomenology is

> *"to let that which shows itseld be seen from itself in the very way in which it shows itself from itself" and then argues: "what is it that phenomenology is to let us see? … is something that proximally and for the most part does not show it self at all; it is something that lies hidden in contract to that which proximally and for the most part show itself; but at the same time it is something that belongs to what shows itself, and it belongs to it so essentially as to constitute its meaning and its ground." (Heidegger, 1962, p. 59)*

For Heidegger what is given is being, but being gives itself not in presence to knowledge but in withdrawal from it. The initiative is no longer with subjective mind that tries to understand the reality of the lifeworld but with being that calls *Dasein* to thought.

An even more severe critique of phenomenology departs from the deconstructive movement and in particular from the Derridean project of the 'deconstruction of presence' (Derrida, 1973). For Derrida phenomenology operates always within "*a metaphysics of presenc*e", the metaphysical assumption that what is present 'here and now' to an observer as an event or thing, is the same as when that same entity was a-historically present. This means that the role of the observer is depreciated while trust is put to an ongoing self-evident presence that guarantees every re-presentation of every previous present thing as such. To give an example, if we notice an event or a thing taking place or existing in front of us, then forget it for a while and then observe it back again, the questions that arise are: 'how do we know that it is the same phenomenon?', and, 'What is it that provides the ongoing temporal horizon for the observer to assume that the event or material thing is the same in both situations?' For deconstruction this self-presence is the product of a recurrent

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reject Husserl's phenomenology altogether. What he simply does is to redefine phenomenology by pointing out the ways that it subscribes to metaphysics {see §5.2.2}.

symbolic substitution similar to the effects of the notion of différance. Mensch argues then that:

> *"As such, its ground is a nonpresence. Its basis is the absence that allows the substitute to take place of what it substitutes for."(Mensch, 2003)*

Therefore the hypothetically indisputable presence is functioning upon the ongoing recalling of what is not present (past) to assure its existence here and now[77].

Building on and moving forward from the Husserlian phenomenology, *hermeneutic phenomenology* and its interpretation of Being (or hermeneutics of Dasein) is particularly interesting for the analysis of the notions of communication and collaboration. Interpretation as a process is central to the phenomenological thinking where it is considered as the active process of assigning meaning to an experience[78]. This is to be thought as a recursive, feedback mechanism, where experience stimulates meaning creation while the latter triggers experiencing. This continuous refinement of meanings by moving from the specific to the general and back to the specific, is called a *hermeneutic circle* and is similar to the functioning of the triadic model of semiosis.

Communication and collaboration in the phenomenological tradition are posited as processes of dialogue or 'experiences of otherness' in terms of participatory interaction. Communication and collaboration, theorised in this way, transcend the early (Saussurian) semiotic beliefs, where intersubjective understanding can be mediated only by the use of signs, with stable meaning (Stewart, 1995, 1996) while at the same time surpass the *rhetorical* theorisation of communicative and collaborative actions which involve adroit handling or strategic manipulation of signs. Thus, for a phenomenologist, communicative and collaborative activities explain the interplay of identity and difference in authentic human relationships and cultivate participatory practices that make possible and maintain participants' relationships of unquestionable value. As Craig states in analysing the phenomenological tradition:

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[77] This lack of self-presence becomes for Derridean deconstruction a different problem that of the infinite regression and thus finds itself in another type of metaphysics that of radical deconstruction and the absolute absence of presence {see §5.2.2}.

[78] This is oppositional to the structuralist view of semiotics where interpretation is to be separate from reality. For phenomenology, interpretation is "What is real for a subject". Reality is considered existing but also subjective. Interpretation is an active process of the subjective mind a creative act of clarifying personal experience.

> *"Authentic communication, or dialogue, is founded on the experience of direct, unmediated contact with others. Communicative understanding begins in prereflective experience arising from our bodily existence in a shared lifeworld. Once we set aside the dualisms of mind and body, subject and object, as phenomenologists argue, we see that direct, unmediated contact with others is a very real and utterly necessary human experience, although it may be a fleeting experience that easily degrades into some form of inauthenticity." (R. Craig, 1999, p. 139)*

Reality construction that derives from the hermeneutic phenomenological view of Heidegger, sees 'reality' not as the effect of uncontaminated, natural experience, but that which is created by the use of language within a context of everyday life. In fact, communication is considered the vehicle by which meaning is assigned to experience while collaborative action is the purposeful participatory activity of the possibility of communication. Communicative collaboration is seen as an alternative way of interacting in order to experience the lifeworld while its purposeful behaviour is thought to affect the ways meaning is modifying the intentional methods of interaction.

Thus, the theoretical basis of phenomenology is interesting from a practical standpoint primarily because it both preserves dialogue, in its discursive expression (proceeds to a conclusion by reason or argument rather than intuition), as an ideal form of communication, yet also demonstrates the inherent impossibility of sustaining dialogue in a pure and uncontaminated configuration towards absolute communication. Therefore, phenomenology provokes logocentric faith in the consistency of methods and techniques for achieving meaning in communication and collaboration, and also problematises commonsense distinctions as those between mind and body, facts and values, words and things. Furthermore, while the phenomenological tradition of communication and collaboration suggests that the use of dialogue is a form of direct, unmediated contact between communication and collaboration participants, it also questions the structuralist arguments of traditional semiotics where communication can occur only through the mediation of signs. In addition, while phenomenology from a rhetorical point of view might seem utterly simplistic or marginally idealistic in approaching practical dilemmas that real communication participants must face, the tradition of rhetoric can seem excessively sceptical or pessimistic about the possibility of meaningful contact among the participants.

To summarise, we support that the phenomenological tradition influenced by the contemporary semiotic tradition and the rhetoric of post-structuralism can offer a thought-provoking philosophical system that can in fact support the production of a theoretical compound for communication and collaboration.

4.3 Systemics and Cybernetics in Communication and Collaboration

Systemics and Cybernetics[79] is the study of systems and the ways a systemic reality is constructed. It has been particularly powerful in seeing and describing this assumed reality in terms of combining parts and wholes and their relationships in a holistic way and has often been used as a reaction to the phenomenological naivety. According to this tradition, reality is not to be found with a simplistic interpretative process of consciousness or independently existing in a natural environment. Rather reality is a complex synthesis of many interacting forces only some of them can ever be revealed to subjective minds at any one time. Understanding is considered to be possible only through a careful examination of interacting parts within the idealistic, ever changing and often inaccessible whole. The key idea behind the systemic and cybernetic tradition is the notion of the *system*. It is considered the cognitive apparatus that organises a representation of observed phenomena in the subjective mind according to a structured scheme. Systems do not exist in nature as pristine realities and prior to conceptualisation. Instead, they are discovered or observed by a subjectivity and particularised according to a self-evident symbolic code that relates its own existential needs to a thereby environment [Image 4-2]. According to Frederick Bates

> *"At the most general level the concept of the system employs the idea of structure as a means of supplying the basis for an explanation of how a phenomenological target works or operates."(Bates, 1997, p. 69)*

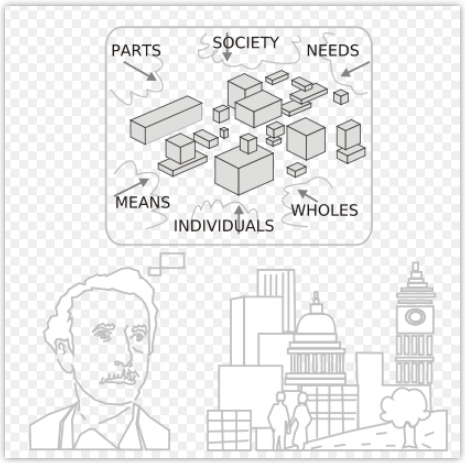

IMAGE 4-2 – SUBJECTIVE NATURE OF SYSTEMIC INTERPRETATION

[79] Cybernetics and other systemic notions are not identical but they have various meaning always within the cybernetic tradition. Most of them are analysed in the following paragraphs.

Beyond the subjective nature of systemic interpretation[80], concepts which function within any notional (epistemological) context and construct such a system are often described as a notional system or epistemological domain (Physics, Mathematics, Design, Computer Supported Collaboration etc). This suggests that the relations that associate concepts, in a logical/methodical manner, also define the concept meaning always in terms of this systemic relationship. This relationship is the *systemic factor* that is an essential component for the production of meaning within any notional context. Another factor that is considered akin to the systemic factor is the *empirical factor*. The empirical factor is inseparable to the systemic factor for the construction of meaning within any notional system. It is seen as an inherent and a priori factor that is bound to the empirical phenomena that are related and examined by the system itself. The resultant function of the intersection of these two factors (systemic and empirical) constructs the identity of any emerging concept of the system and also delineates the ways that the concept will possibly be employed in that system[81].

Within the hermeneutic tradition, contemporary *systems science (or systemics)* is the emerging branch of science that studies systems. Its main purpose is to provide a new paradigmatic shift for the study of phenomena through the use of various epistemological and philosophical paradigms including logic, mathematics, engineering, biology etc. Systems science is closely related to cybernetics of order two and systems theory that derive from the theoretical work of General Systems Theory (Bertalanffy, 1976) and is mainly a reaction to the reductionistic tendencies of the modernist science. Against the immanent modernist view of reality where the whole is the additive result of its parts, systemics draw particular attention upon contextuality or in other words 'holism' that sees as necessary the consideration of the functioning of the interacting elements from within the system and furthermore the relation with the systems inhabiting the environment of that system. In its philosophical expression, systems science also incorporates many metaphysical questions related to contemporary philosophy of both the analytic and continental traditions.

These ideas are reasonably coherent and consistent and they have had a major impact on many fields of human endeavour, including communication, collaboration, design and systems design and development. Due to its wide pertinence in various

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[80] Illustration is made by Marcel Douwe Dekker (2007) based on an own standard and Pierre Malotaux (1985), "Constructieleer van de mensenlijke samenwerking", in BB5 Collegedictaat TU Delft, pp. 120-147.

[81] An example of these factors in the domain of Physics can be described in terms of the concepts of "force", "mass" and "acceleration". The systemic factor of the concept of force is a result of the formalisms in defining the relationships with the concepts of mass and acceleration while the empirical factor of the same concept has to do with descriptions of our everyday experience and analogies to the aforementioned concepts.

environments including, physical, virtual, social and other, cybernetics and systems theory are not considered monolithic but, on the contrary, are seen as a multidisciplinary philosophical domain. In the following we will outline the most important distinctions within the theory of systems: *1) Traditional (early) Systems Theory, 2) Cybernetics, 3) General Systems Theory and 4) Second-order Cybernetics*.

Traditional systems theory considers systems as actually existing structures that can be objectively observed and clearly analysed. Consequently an external observer can work out both the structural components as well as the functionality of a system as a whole. Inputs and outputs of the system are easily detectable as well as manipulable and operable in terms of simplistic interaction. This theorisation of systems took place during the first half of the 20th century and prior to the Macy conferences (1946-1953) period and looked for simple causal relations between variables rather than trying to understand a wide range of interactions. This type of systemic thinking has centred to mechanistic and reductionistic construction of reality. Therefore it has been overcome by the following realisations of systems theory which tried to overturn the linearity of this tradition.

Inaugurated in the Macy conferences and the works of Norbert Wiener, William Ashby and Heinz Von Foerster among others, c*ybernetics* became the successor of the traditional systems theory that emphasised in the study of teleological mechanisms, systems that are considered to embody goals and purposes (Wiener, 1961)(Ashby, 1964)(Foerster, 2002). Today, cybernetics are considered a branch of systems theory that is closely related to control theory and in its narrow sense is the specific field in systems sciences that focuses on communication processes, the analysis of control processes and feedback loops. In particular, cybernetics emphasise on the destruction of linear, deterministic, material and causal model that we met in traditional systems theory.

General Systems Theory originally formulated by the work of Ludwig von Bertalanffy (Bertalanffy, 1976) as a multidisciplinary approach to knowledge based on systemic concepts of holism rather than reductionism. Its application spread across numerous epistemic areas including biology, education, philosophy, psychology, sociology, politics, organisational research, design and systems-design among others. In the words of Bertalanffy the systemic approach became a necessity to overcome the mechanistic approaches that hunted the reductionistic past of systems theories. He argues that

> *"… the necessity and feasibility of a systems approach became apparent only recently. Its necessity resulted from the fact that the mechanistic scheme of isolable causal trains and meristic treatment had proved insufficient to deal with theoretical problems, especially in*

the biosocial sciences, and with the practical problems posed by modern technology…" (Bertalanffy, 1976, pp. 11-12)

General Systems Theory's aim was to determine the holistic nature that systemic thinking should incorporate according to the principal beliefs of systemic epistemology. Thus, by showing how interdisciplinary concepts can be related to a common ground and the ways to form a unified field of knowledge, Bertalanffy recognised the universal nature of systems and attempted to provide alternatives to the superseded conventional models of systemic organisation. Although he focused on the analysis of systems by considering their holistic behaviour as a result of circular non-deterministic interactions his analysis still advocated the radical separation of observer from the observed or the subject/object hiatus that reigned in the traditional systems theoretical apparatus aw well as the belief that a common language can be constructed. In Bertalanffy states:

"A unitary conception of the world may be based, not upon the possibly futile and certainly farfetched hope finally to reduce all levels of reality to the level of physics, but rather on the isomorphy of laws in different fields… this means… that the world, that is, the total of observable phenomena, shows structural uniformities, manifesting themselves by isomorphic traces of order in its different levels of realism" (Bertalanffy, 1956, p. 8)

This illusionary conception of perfect observation that marginalised the consideration of values and subjectivity in the production of knowledge and lies at the heart of cybernetics of order one, as well as in General System Theory's advocates(J. G. Miller, 1995), expectedly invited outspoken criticism (Olsson & Sjöstedt, 2005)(Midgley, 2000, p. 34).

In the late 20th century and in the beginning of the 21st century, influenced by the recent developments in other scientific and cultural areas (constructivism, modern – postmodern debate, the Relativity Theory paradigm-turn in physics), most of the research agenda that relates to systems theories have come to reject the inherent objectivity of observation of all the aforementioned systemic traditions. *Second-order Cybernetics* (or *"Cybernetics of Cybernetics" or New Cybernetics*[82]) developed as an alternative perspective that aims to investigate the construction of models of cybernetic systems of order one and holds that observers are always part of the observing system, thus influencing the observed phenomenon (Foerster, 1981). This is equal to the paradigmatic shift that took place in the third stage of the ontogeny of

[82] Proposed by Pask in (Pask, 1996) as an attempt to move away from the cybernetics that have been proposed by Norbert Wiener.

Being {see §5.3.1} and later became the contemporary paradigm in all scientific domains. Second-order cybernetics thus distinguished itself from the mechanistic approaches of previous disciplines and emphasised on the analysis of the observer, as a cybernetic system itself, in modelling any system. Related to the subjectivity of modelling systems, the notions of autonomy, autopoiesis, self-referentiality and dynamic systems, self-organisation, cognition and the distinction of open and closed systems[83], played an important role in this movement (Maturana, 1988; Maturana & Varela, 1979, 1992, 1975; Maturana, Poerksen, W. K. Koeck, & A. R. Koeck, 2004; Mingers, 1994; Pask, 1996; Francis Heylighen & Joslyn, 2001; Luhmann, 1986, 1996).

Systems in second-order cybernetics are considered to be complex, self-contained or self-governed which means that in order to take advantage of the logic contained within the cognitive apparatus that defines their 'systematicity', observers must also consider the *autonomous nature* that these systems exhibit in terms of their organisation. An interesting phenomenon that can be observed in complex systems is their non-deterministic bifurcation evidenced in dynamic trajectories which emerge as higher-level processes. Although many researchers agree that such processes display properties of adaptive behaviour that is considered the result of the interactions between simpler systems, it is still unverified how the elements that comprise a complex system cooperate in order to form the supra-individual conditions and bifurcations and lead to adaptive behaviour.

Thus, while *complex systems* (natural or artificial, i.e., human designed) are constituted by an abundance of elements that interact in parallel and simultaneous[84] fashion, self-organising systems are those in which spontaneous ordering tendencies can also be observed. Such systems exhibit what is called the '*self-organising behaviour'*, are auto-catalytic[85], nearly decomposable and are susceptible to the initial conditions when they are in the chaotic regimen.

[83] Bates argues that the classification of *closed* and *open* systems is unclear and proposes the terminology of *passive* and *active* systems (Bates, 1997, p. 94). Others propose the notions of *closed systems* and *operationally closed open systems*.

[84] These can include computational systems, networks, and databases etc.

[85] Systems are characterised auto-catalytic when the reaction product is itself the catalyst for that reaction.

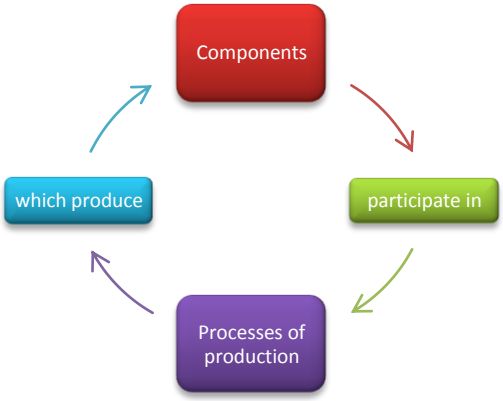

FIGURE 4-8 – CIRCULAR PROCESSES OF PRODUCTION IN THE AUTOPOIETIC MODEL

This autonomy is seen always relatively to the maintenance of the organisation of the system, as the self-asserting capacity of systems to maintain their assumed identity through the active compensation of deformations. This is related to what first the psychiatrist and engineer W. Ross Ashby introduced in cybernetics of order one, as *self-organisation* (Ashby, 1947). Self-organisation thus refers to a process in which the internal organisation of an system, increases, in terms of automatic - self-guided - processes, without being managed by an outside source; systems typically (though not always) display emergent properties.

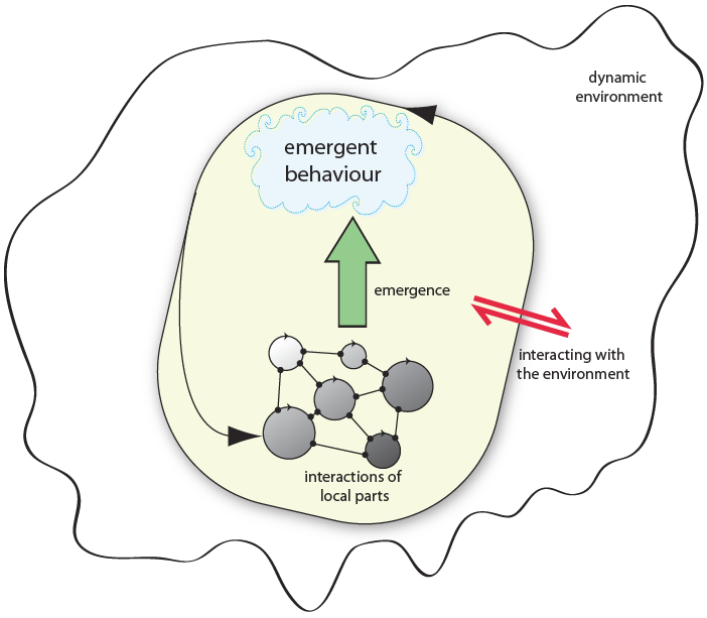

FIGURE 4-9 – SELF-ORGANISING UNITY INTERACTING WITH ITS ENVIRONMENT

In other words, the constraints on form (i.e., organisation) of interest to an observing subjectivity occur internally to the system and are a result of the interacting parts of the system and usually exhibit independent (emergent) phenomena to the physical

nature of those components [Figure 4-9]. These phenomena that were not previously existed (even if they were not observed) as a functional characteristic of the system are considered the *higher level properties*[86] of the system and are regarded as *emergent*.

This organisational activity evolves in either time or space, preserves a static configuration or presents ephemeral phenomenological behaviour. Thus it can be said that self-organising systems are those in which spontaneous ordering tendencies are observed.

> *"Self-organizing systems are characterized by a collective interaction between the components of a system such that a higher-level pattern, called the order parameter or the collective variable, emerges from the dynamic relations established amongst the elements at a lower level, which, in turn, causally constrains the behavior of the low-level components." (Loula, Gudwin, & Queiroz, 2006)*

However, self-organisation as a notion has been redefined by many different formulations during the different periods of the systems thinking evolution[87]. Some researchers are in line with Ashby's initial concept while others are deviant. As follows, Ashby's self-organisation is to be seen as a loop within an environment while the succeeding formulation that Heinz von Foerster introduced is considered a loop including awareness of the environment. In Foerster the system and the environment are considered as an interactive whole plus the inclusion of the observer in the

[86] There are three attributes that are involved in this description: supervenience, aggregation and causality. Supervenience (a central notion in analytic philosophy (McLaughlin & Bennett, 2005)) is the assumption that the emergent properties exist in terms of a stratificatory relationship where the lower levels of the stack support and are the necessary prerequisites for the higher levels to exist. Thus if lower levels are removed the higher levels also collapse. In addition to supervenience, the emergent properties of the system are not aggregates and consequently are in line with the systemic conception where the whole is greater than the sum of its parts. Causality is here to remind us that the emergent properties of the higher levels are not epiphenomenal and hence should always have causal effects on the lower level entities. This is what we earlier called *downward causation* {see §5.2.5} and is a regressive property of the self-organising system that implies the bidirectional interaction between the emergent and generative levels.

[87] Today the main scientific theory related to self-organisation is Complexity Theory which states that "Critically interacting components self-organize to form potentially evolving structures exhibiting a hierarchy of emergent system properties." The elements of this definition relate to the following: 1) Critically Interacting - System is information rich, neither static nor chaotic, 2) Components - Modularity and autonomy of part behaviour implied, 3) Self-Organize - Attractor structure is generated by local contextual interactions, 4) Potentially Evolving - Environmental variation selects and mutates attractors, 5) Hierarchy - Multiple levels of structure and responses appear (hyperstructure), 6) Emergent System Properties - New features are evident which require a new vocabulary (Lucas, 1997).

observing system. Nicolis & Prigogine defined self-organisation in terms of dissipative structures that have the ability to conserve 'information' across their evolutionary changes (Nicolis & Prigogine, 1977). Autopoiesis is the process whereby organisation self-maintains its unity by using component-producing processes. This means that the components, through their interactive activity generate in a recursive manner the network of processes which earlier produced them. This is a form of system organisation where the system as a whole produces and replaces its own components and differentiates itself from its surrounding environment on a continual basis.

Maturana and Varella state in defining autonomy in relation to autopoiesis for living systems:

> *"We use the word autonomy in its current sense; that is a system is autonomous if it can specify its own laws, what is proper to it. … We are proposing that the mechanism that makes living beings autonomous systems is autopoiesis. This characterises them as autonomous."(Maturana & Varela, 1992, pp. 47-48)*

The concept of autopoiesis is a special case of homeostasis. It is related to self-production and came from the analysis of the living cell which has been identified as a self-producing system. Based on self-reference and self-regulation, self-producing / autopoietic systems are considered to evolve using structural couplings with other systems in their horizon. This hypothetical model of the reality of living systems recognises that influences external to the organisational structure of the system cannot shape the system's internal organisational structure as such, but only act as triggers to cause the organising mechanism (i.e., structure & structural interactions) to either modify its current attractors or to decay by putting itself in a state of organisational inertia (or disintegration in Maturana's terms).

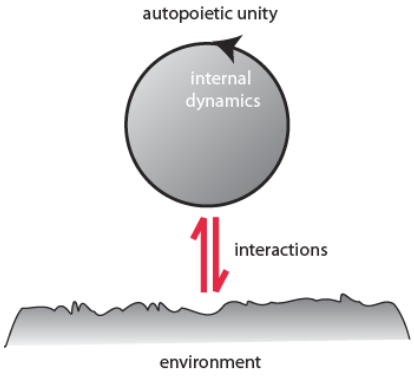

FIGURE 4-10 – AUTOPOIETIC UNITY INTERACTING WITH ITS ENVIRONMENT

This state of interaction between the autopoietic unity and its environment along with the observation of the whole process [Figure 4-10], is seen by Maturana and Varela as an ontogenetic process (Maturana & Varela, 1992, p. 75). In these interactions the structure the environment *triggers* the structural changes that occur

in the autopoietic system (it does not directly specify them), and at the same time the autopoietic system produces changes on its environment (this has also been depicted by [Figure 4-11]). As long as both the autopoietic system and its environment continue to interact, a *'history of mutual congruent structural changes'* occurs. These recurrent interactions between two or more systems develop a domain of *'structural coupling'*.

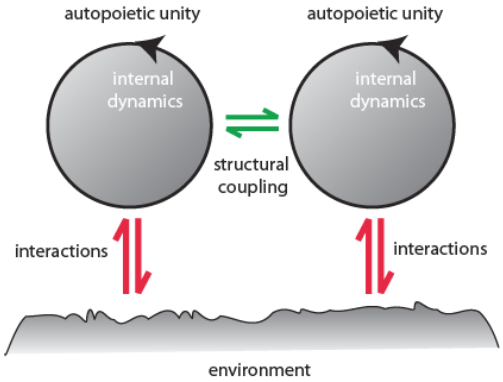

FIGURE 4-11 – STRUCTURAL COUPLING WITH THE ENVIRONMENT AND SYMBIOSIS

This notion of systemic openness on the one hand and its organisational closure on the other has been metaphorically[88] applied to systems of different order couplings like the conscious (Maturana & Varela, 1979), the biological (Luisi, 2003), the organisational (Beer, 1994b, 1995) (Radosavljevic, 2008), the social (Luhmann, 1986, 1996, 1990)[89], the technological (Winograd & Flores, 1987), the literary/language (Tabbi, 2002) (Livingston, 2005) and others (Mingers, 1994, 2004; Mingers & A. Gill, 1997) (G. Morgan, 1996, chap. 8)(Robb, 1991)(Leydesdorff, 2001)(Zeleny & Pierre, 1976; Zelený, 1977, 1981; Zelený & Hufford, 1992)[90](Capra, 2004). These are

[88] Varela remained somewhat sceptical about these extensions of autopoiesis (Varela 2000, as mentioned in Luisi, 2006, p. 176) *"These ideas are based, in my opinion, on an abuse of language. In autopoiesis, the notion of boundary has a more or less precise meaning. When, however, the net of processes is transformed into one "interaction among people", and the cellular membrane is transformed into the limit of a human group, one falls into an abuse, as I expressly said."* Maturana was kin to the idea of cross disciplinary use of the autopoietic notions. Despite Francisco Varela's doubts, it appears that, *"owing to the theory of autopoiesis, a field has been created that did not exist before, with new perspectives for understanding some aspects of social behaviour, which can be taken as an indication of the fertility of autopoiesis"* (Luisi, 2003). Others that questioned the direct applicability of the autopoietic theoretical apparatus to different disciplines and a more comprehensive and in-depth account of the historical debate can be found elsewhere (Mingers, 2004)(Zolo, 1992)(Kay, 2001).

[89] Luhmann recognises that social systems, unlike living ones, make use *communicative actions* as their particular mode of autopoiesis and thus poses a clear distinction between the *social* and the *physical*.

[90] Zelený & Hufford suggested an application of autopoiesis to human family, an approach that, as shown later, has met profound criticism and brought forward a wide scepticism for the

considered as third order couplings, or systems that emerge out of semiotic or social interactions, such as languaging, communication and collaboration. Seen through the prism of the aforementioned systemic attributions, these concepts of have potential applicability in the development of contemporary communication and collaboration research , social systems analysis, information / communication / collaboration / coordination systems design and development, artificial intelligence etc.

Another important notion that emerges from the systems theoretical apparatus of self-organisation and is closely related to the communicative and collaborative research is the notion of stigmergy. *Stigmergy* is an empirically observed phenomenon[91] that is met in collective, multiagency settings where peers (individuals) and wholes (communities e.g., groups, organizations, social systems etc.) are seen to co-create themselves in a perpetually interactive relationship. This emerging property that resides not only in and amongst the totality of the participants involved, but also in the relationships among them and their dynamic environment is called *stigmergic intelligence* (Parunak, 2005)(M. Elliott, 2007).

Stigmergic collaboration and coordination processes are clearly related to the self-producing processes of self-organising systems, and as Parunak characteristically states:

> *"The central insight of stigmergy is that coordination can be achieved by resource-constrained agents interacting locally in an environment. Two fundamental principles govern the success of this strategy: 1) No matter how large the environment grows, because agents interact only locally, their limited processing capabilities are not overwhelmed. 2) Through the dynamics of self-organization, local interactions can yield a coherent system-level outcome that provides the required control.*

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philosophical implication of autopoietic theory in general (Geyer, 1992)(Fleischaker, 1992)(Kenny, 1992)(Mingers, 1994, 2002, 2004)(Radosavljevic, 2008).

[91] The term stigmergy was first coined by Pierre-Paul Grassé in relation to his research on termites (Grassé, 1959a, 1959b). "*Grassé showed that a particular configuration of a termite's environment (as in the case of building and maintaining a nest) triggered a response in a termite to modify its environment, with the resulting modification in turn stimulating the response of the original or a second worker to further transform its environment. Thus the regulation and coordination of the building and maintaining of a nest was dependent upon stimulation provided by the nest, as opposed to an inherent knowledge of nest building on the individual termite's part. A highly complex nest simply self-organises due to the collective input of large numbers of individual termites performing extraordinarily simple actions in response to their local environment. Since Grasse's research, stigmergy has been applied to the self-organisation of ants, artificial life, swarm intelligence and more recently, the Internet itself*" (M. Elliott, 2006).

> *The essence of stigmergy is the coordination of bounded agents embedded in a (potentially unbounded) environment, whose state they both sense (to guide their actions) and modify (as a result of their actions). The ability of stigmergic systems to scale without overwhelming individual agents requires that the environment offer a topology in which agents are situated locally, and within which their actions and senses have a limited horizon." (Parunak, 2005)*

Thus, a stigmergic system can be described in terms of the participating peers, the communication medium, and the environment that provides a horizon of interaction and is recursively defined through these [Figure 4-12]. In brief, each participating peer is seen to expose the following characteristics:

- Is an open system that interacts with the environment,
- It develops an internal self-producing functionality that is organisationally closed (thus invisible) to the other participating entities,
- Through this idiosyncratic functionality it also develops methods or actuators for interacting and altering the status of its environment but also the status of the internal states that produce this functionality.

Accordingly, the environment has a dynamic, non-deterministic structure that provides the basic rules for the development of evolutionary states of interactions and allows interpretations of these to all the participating entities.

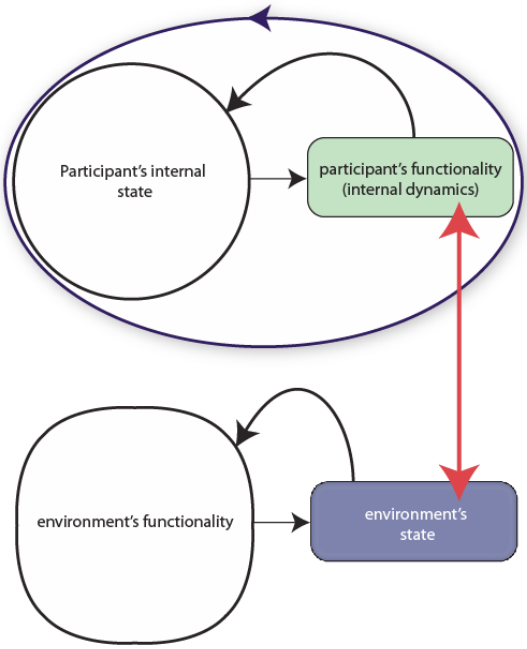

FIGURE 4-12 – ARCHITECTURE OF STIGMERGY

The importance of self-organisation, autopoiesis and stigmergy in different domains became clearer after the loss of the belief of the certainties that modernism supported. Postmodern theories and epistemology amplified this move to theories independent of ontological and transcendental values. Interestingly enough many of the notions that are used in second-order cybernetics are very similar to the phenomenological tradition that Heidegger proposed in his analysis of Dasein. For many constructivist approaches and alike to the autopoietic model of autonomy and self-referentiality, the conception of the system as a *black-box* isn't defined anymore by it's behaviour, but equally by it's ability to reveal and sustain its being within a network of interactions. The entire set of complex processes re-produces themselves; the 'Eigen-results' and 'Eigen-loops' become identical.

As we have seen, in many cases, the developments of the cybernetic tradition have been imported to a variety of disciplines, in rather influential but also naive manners. In general it can be argues that the second-order cybernetics paradigm, including the notions of autopoiesis, self-organisation and stigmergy is well adapted to a number of contemporary philosophic disciplines (including (mass) communication and collaboration, social systems research, organisation research etc.) and today is considered a pluralistic theoretical paradigm that frees us from the conservative types of constructionism that are based on mechanistic, reductionistic, and also the radically postmodern / relativistic views of reality. According to the recent cybernetic paradigm of critical realism, '*there is a single, real, materially existing world*' that is ultimately inaccessible. This leads, to a proliferation of domains of experience and interaction essentially free from the reductionistic confidence on the establishment by the material. Participants in these domains (including science and philosophy) produce interpretations of the 'real' but they are inherently bound both in the pre-existing determination of this 'real' and its concurrent instances that are realised thought their reciprocal actions of interaction; creative communication, collaboration and design. This anticipation of 'reality' does not have faith in a structuralistic, conformist view of constructionism, but conceives the interpretation and development of the actual as a pluralistic and creative process.

In terms of communication and collaboration the cybernetic tradition offers a number of important developments both at a theoretical and practical level. The early, first order, cybernetics epitomised the transmission model of information processing for explaining all kinds of complex systems (living or non living). This theoretical model of communication and collaboration conceived human participatory activity as a situation of problematic nature. It regarded communication problems as breakdowns in the flow of information, resulting from noise, information overload, or mismatch between structure and function. In terms of the intervention techniques for solving communication problems the early cybernetic tradition offered various information-processing technologies and related methods of systems design and analysis, management, and, on the "softer" side, therapeutic intervention (R. Craig, 1999, p. 141). This pursuit towards theorising communication and collaboration made

apparent that the problematic situations of participatory activity are not simplistic notions of linear cause and effect, but complex processes of unpredictable behaviour that always include. Mainly for this reason, first order cybernetics applicable to the social and the biological[92] are replaced by cybernetics of order two where the requirement for a possibly constructivist participant observer is

The practical lesson of cybernetics that "the whole is greater than the sum of the parts", and its important message that participants must transcend individual perspectives and look at the communication and collaboration process from a broader, systemic viewpoint, while at the same time not hold individuals responsible for systemic outcomes that no individual can control, collides with the paradoxical nature of the deconstructive rhetoric of the post-structuralist thinking which suggests that such contexts are always-already the means of the very possibility of communication, collaboration and social behaviour. The cybernetic notion of intervention towards problem solving is replaced by the (de)constructive theorisation where the exception becomes the rule for systemic existence and the elusive whole is always different and incomparable, rather than greater, to the sum of its parts. The linguistic meta-ontological and metaphysical comparison of "greater than" is replaced by the paradoxical notion of incommensurability that sustains communication and collaboration as 'a system without a system', an eventful and dynamic 'subject in process' detached from the logos of the sovereign knower. Thus, the great practical lesson of cybernetics can be transformed to include the possibility of a paradoxical character of symbolic communication and collaboration as surface events, where the quasi-reflexive identities of the participating actors and their 'sphere of interaction' are introduced in terms of an event of in-betweening of closure and openness.

4.4 Sociopsychological Tradition in Communication and Collaboration: Expression, Interaction and Influence

The *Sociopsychological* tradition originates in the fields of sociology and social psychology and has been mostly valuable in various fields of inquiry of the social and individual qualities. In particular, focuses in describing participants and their specific characteristics when involved in networks of social interactions. Thus, it helps to the understanding of individual social behaviour, psychological variables, individual effects, personalities and traits, perception and cognition and how all these emerge in systems of social interaction. This tradition is believed to inaugurate in the Enlightenment project of humanism where the main focus of analysis is the

[92] Heinz von Foerster characteristically states that "the cybernetician, by entering his own domain, has to account for his or her own activity. Cybernetics then becomes cybernetics of cybernetics, or second-order cybernetics." (Foerster, 2002, p. 289)

autonomous individual who is seen to participate and interact within a system of social reality that is constructed by his/her own will. This view of social psychology identifies participants of social systems as entities with special characteristics who contribute to their autonomous behaviour.

In opposition to the ideas of the humanist project, current views of the sociopsychological tradition relativise the relationship of the individual to the society. According to these views, individuals that engage in communicative and collaborative actions are always performing within the boundaries of a social system. According to contemporary sociocultural theories these individuals (or in other words participants or communicators or/and collaborators) are seen to exhibit several properties, including: the locus for processing, understanding and producing meaningful perturbations to the environment (i.e., information) but also acknowledge the communicative couplings that take place among them as well as the influence of the environment over them.

Consequently, the sociopsychological tradition is focusing to analyse the properties of the individual participants in communicative actions. Thus many consider this tradition as the 'science of human communication' (C. R. Berger & Chaffee, 1987). This occurs primarily because the key ideas behind the sociopsychological tradition are focusing on explanations that can be 'measured' in terms of 'qualoid' and 'quantoid' qualities.

In communication the key ideas include: persuasion and attitude change, how message strategies are planned by participants, how messages are transmitted and how their content is processed and what are the effects of messages on the participants. In collaboration the key ideas include: persuasion and attitude change in terms of planning and cooperating, how purposeful strategies of cooperation are planned by participants, how ideas of cooperative work is transmitted and how its content is processed and finally what are the effects of collaborative action on the participants.

According to the sociopsychological tradition the mechanisms that are responsible for the production of communicative and collaborative behaviour are ontologically unattainable. Characteristically, LittleJohn states that among scientists of the sociopsychological tradition it is acknowledged that:

> *As communicators [and collaborators], we may be very aware of specific aspects of the process such as attention and memory, and we may be very aware of the specific aspects of certain outputs like plans and behaviours [including artefacts as a result of collaborative activity] but the internal processes themselves are behind the scenes. (Littlejohn, 2007, p. 42)*

The major issues in sociopsychological tradition, related particularly to communication, can be summarised according to the following themes that Littlejohn proposes in his review. These themes can be expanded to include issues of collaboration as follows:

- How participants in communication and collaboration situations produce behaviour?
- How this behaviour can be predicted?
- How do individual participants take into account and accommodate different communication and collaboration situations?
- How do communication and collaboration participants adapt behaviour among each other?
- How is information assimilated, organised, and used in forming message strategies, plans and situated actions in terms of purposeful behaviour?
- By what logic do people make decisions about types of messages and planning behaviour they wish to use?
- How communicative and collaborative meaning is represented in participants' minds?
- How do participants attribute the causes of behaviour?
- How is information integrated to form beliefs and attitudes?
- How do these attitudes change?
- How are messages assimilated into the belief/attitude system?
- How are expectations formed in interactions with others?
- What happens when expectations are violated?

To answer the aforementioned issues researchers in the sociopsychological tradition introduced a number of different approaches. These approaches analyse the *behavioural*, *cognitive* and the *biological* aspects of communication and collaboration.

In particular, behavioural theories (e.g., psychology, trait theory) concentrate on how participants behave in communicative and collaborative contexts and typically look at the relationship between communication behaviour – what is said and what is done – in relation to such variables as personal traits, situation differences and learning. The focus is to describe how behaviour is developed in terms of an analysis of a stimulus response model; what psychologists call 'learning perspective' and is categorised under the philosophical tradition of psychology that is related to *Behaviourism*. As Sellars mentions:

> *"A psychology is behaviouristic in the broad sense, if although it permits itself the use of the full range of psychological concepts belonging to the manifest framework, it always confirms hypotheses about psychological events in terms of behavioural criteria…*

Behaviourism, thus construed, is simply good sense."(Sellars, 1991, p. 22)

Today this model of empirical analysis, that denied the importance of the presence and influence of mental activities, is regarded an overly simplified one-dimensional explanation of human behaviour and is heavily criticised for its reductionistic, mechanistic and materialistic criteria. Instead, a strong tendency towards pluralistic and systemic interpretations of human behaviour is common today.

The *cognitive* approach is centring on the analysis of patterns of thought and concentrates on how individuals acquire, store, and process information in a way that leads to behavioural outputs and consequently to acts of communication and collaboration. This approach is mainly related to the *cognitivist* tradition, and perversely to behaviourism, denies the stimulus-response model and focus to the study of mind and intelligence. The intellectual background of cognitivism is situated in the mid-1950s when researchers in numerous disciplines of scientific research began to develop theories of mind based on complex representations and computational procedures. For the study of communication, cognitivist approaches give particular emphasis on the ways participants think, organise and store information and how cognition helps in shaping their behaviour. The cognitivist theories related to communication and collaboration that are important in cognitivist approaches are *attribution theory*[93], social judgement theory[94] and elaboration-likelihood theory[95].

The biological approach combines the psychological and biological characteristics of human beings in researching human behaviour. The importance of research done in genetics in the last decades of the 20th century, amplified the tendency towards a biologically inspired interpretation of the human being and its characteristics. Thus, nowadays, researchers, of numerous disciplines, consult analyses of human behaviour in terms of neurobiology. These emerging analyses/theories mainly try to correlate human traits, ways of thinking and behaviours to the biological explanations of the nature of human being that originate from other scientific disciplines related to biology. These biologically inspired analyses contradict to the behavioural and

[93] Attribution theory is a theory which analyse intersubjective behaviour, i.e. how individuals seek to understand (through causal explanations) their own behaviour and that of others, by observing how individuals behave and by recording individual's patterns of perception (perceptual styles). Then, attribution theory deals with the ways participants infer causes of behaviour (personal and of the other) (Heider, 1967).

[94] Social judgement theory is a theory which focuses on how judgements are made in terms of social interaction (C. W. Sherif, M. Sherif, & Nebergall, 1982).

[95] Elaboration-likelihood theory is a theory of persuasion, primarily because it tries to predict when and how participants will or will not be critical in terms information processing and communicative meaning.

cognitive approaches and support that communicative and collaborative behaviour do not derive from situational factors (social interaction, learning etc.) but from inborn neurobiological influences and thus introduce *communibiology*, a notion (or 'paradigm' as Beatty et al. suggest) that refers to the study of communication from a biological perspective (psychobiology) (Beatty, McCroskey, & Valensic, 2001).

4.4.1.1 Summary

As it has been presented, sociopsychological approaches theorise communication and collaboration in terms of metaphors for methodological inquiry. At the same time, these approaches provide plausible explanations of communicative and collaborative human behaviour and appear practically useful, primarily because they appeal to commonsense beliefs. But on the other hand they challenge the equally commonsensical idea that human behaviour is to be understood as objectively rational. Thus, communication and collaboration are processes by which individual participants interact and influence each other behaviour and psychological status. Whatever might be the medium (natural or technological), "*it involves, contrary to the phenomenological view, interposed elements that mediate between individuals*" (R. Craig, 1999). Whatever might be the abstract sign, as in Saussurean semiotics, communicative and collaborative activity in sociopsychological tradition is always mediated by the personality traits, attitudes, emotional states, unconscious conflicts and other individual differences that surface, due to the effects of the social interaction. As Craig puts it: "*Communication theorized in this way explains the causes and effects of social behaviour and cultivates practices that attempt to exert intentional control over those behavioural causes and effects*". But, sociopsychological approaches appear useful, primarily because they have great influence and appear compatible with 'a rationalised model of reality' that can be linked to the causes and effects of everyday communicative and collaborative activity. Participants tend to think that the ways of participating in purposeful activities are closely related to individual behaviour, and therefore, they engage in the process of analysing such personal qualities. In group work situations, participants recognise that individual roles and behaviour are important variables that influence group outcomes and thus they try to understand them in order to manage the collective behaviour. But often, the various approaches in the sociopsychological tradition undermine the individual rationality and autonomy by being adherent of the collective or of the 'scientific' methods (or universal mechanisms) that are supposed to provide evidence through experimentation (Greene & Geddes, 1993). These approaches, and their evidential character that is based on experimentation, contradict to the rhetoric and cybernetic traditions; for being non substantial in terms of its techniques and for reducing communicative and collaborative activities to symbolic/information processing respectively.

Similarly to the sociopsychological tradition, the Sociocultural Tradition also seeks to examine the individual when interacting with others. While the sociopsychological centre on the individual behaviour the sociocultural focuses on an analysis of the social interaction.

4.5 Sociocultural Constructionism in Communication and Collaboration: The Reproduction of Social Order

Influenced by the epistemic traditions of anthropology and sociology and their related semiotic concepts, sociocultural approaches to communication and collaboration theory consider the latter notions as "*symbolic processes that produce and reproduce shared sociocultural practices"* (R. Craig, 1999, p. 144). The sociocultural approaches address the ways that notions, which emerge at a social level, are exercised in communicative and collaborative practice and therefore are considered the means to explore the lifeworld, a world that subjects may experience together. Reality in Sociocultural Tradition is not conceived as an independent, unbiased collection of arrangements external to the world that participating subjects experience, rather, reality is sociocultural and is constructed through a process of communicative and collaborative activities that take place in (and simultaneously establish) various societal structures (groups, organisations, communities, cultures etc.). Therefore, because everyday practice of socialisation is depended on previous shared cultural and societal structures, and at the same time this very interaction that occurs spontaneously, in many ways, reproduces these structures in a recursive manner, the sociocultural constructionism (and its reality) is better described as a paradoxical theorisation of creative behaviour.

The philosophical traditions of constructivism and constructionism direct the focus of the sociocultural approaches towards the analysis of the patterns of interaction among participants in communicative and collaborative practices, rather than towards a simple mechanistic interpretation of individual characteristics or mental models. Thus, in this tradition, individual characteristics and behaviour are less important compared to the characteristics of interaction at communicative and collaborative levels. Departing from such an understanding of reality, as a developmental process based on interaction, Sociocultural Traditions have little faith on primary methods and grand theories for research. Instead they consider knowledge as local rather than universal, interpreted and constructed, but also, influenced by the research protocol itself (is a bottom up approach). Language is the all-embracing context that provides the means for action and meaning to be formed while at the same time it is recursively reproduced by its actual use. Thus, sociocultural theories tend to deal with the ways meaning is created in social interaction in actual situations (Littlejohn, 2007, p. 44).

An important theme in Sociocultural Traditions is the classification of identities in terms of social structures, including groups and cultures. Identity becomes a synthesis of subjective behaviour within social roles, participation in communities and cultures

and thus is considered perpetually evolving and situational. Equally important is the cultural element which, on the one hand, is considered the result of social interaction while on the other, is the constitutional component for forming contexts for action and interpretation. These contexts, or discourses surrounding a language which has been created and is interpreted under specific circumstances, are described as important intellectual systems for the actualisation of communication and collaboration. In these contexts, localised symbolic interaction is already important while inter-contextual transfer of symbols provides the means for pluralism in the creation of meaning. Moreover, the paradoxically defined character of culture and context, primarily because of their interdependence, is evidently the non-constraining characteristic of sociocultural approaches that leads towards pluralism rather than homogeneity. Although that many approaches are seemingly focusing on localised (contextual) explorations of the sociocultural interaction, they fully recognise the importance of the whole situation and try to achieve it through methodological pluralism.

Important exemplars in the Sociocultural Tradition and in turn for the analysis of the theoretical and methodological status for communication and collaboration that emphasize the importance of studying the social world as a naturally occurring world without the intervention of experimental or quasi-experimental methods (Hughes, 1990) are: *symbolic interactionism, constructionism, sociolinguistics, philosophy of language, ethnography and ethnomethodology*.

4.5.1 Symbolic interactionism

Symbolic interactionism or *interactionism* (Blumer, 1986) is one of the major theoretical perspectives in Sociocultural Tradition that mainly derives from research done in the epistemic field of sociology and is primarily influenced by the works of Weber, Peirce, Dewey, Cooley and Mead (Plummer, 1991). Departing from the philosophical traditions of pragmatism and phenomenology, both philosophers give great emphasis on the analysis of social processes and in particular on the importance of subjective meaning of human behaviour. Symbolic interactionism is thus considered the process of interaction in the formation of meanings for individuals. The insight for this theory inaugurates in Dewey's pragmatism (Dewey, 1981) in which human reality is best understood in a practical, interactive relation among human beings and their environment. Therefore, the social interactionist perspective observes society as organised and tries to identify pattered interaction among individuals. Specifically, for the study of communication and collaboration (are considered social relationships), the aim of social interactionism is to analyse participation processes, or in other words the subjective, micro-structural, characteristics of social life, rather than on the objective, macro-structural, features of social systems. Thus, in opposition to the functionalist beliefs, interactionists focus on human analysis (participant observation) rather than an analysis of the societal

macro-level. Interactionists argue that 'close contact' and engagement in the daily lives of the participants in communication and collaboration is essential for grasping the meaning of their context and thus describing it. The contextual meaning is not sublime or metaphysically established. The inherent pragmatism of the interactionist perspective regards meaning to be located in the actions and the process by which actors construct the situation through their interaction. Symbolic Interactionism holds the principal of meaning to be the central aspect of human behaviour (E. A. Griffin, 2002).

The interactionist theoretical apparatus considers human beings as pragmatic actors who continually adjust their actions to the actions of other actors always within a sociocultural milieu. This social context is believed to provide the necessary symbolic 'infrastructure' that leads to interpretation of both symbolic behaviour and intersubjective behaviour and consequently leads to an explanation of the anticipatory mechanisms the participants produce for social interaction. Therefore, social interactionism observes the actions of participants in terms of their communication and collaboration processes, and considers them, not as passive, conforming objects of socialisation, but rather as active, creative actors who collaboratively construct their social world. Thus, symbolic interactionism is considered an important theoretical perspective for the analysis of communication and collaboration primarily because it perceives these notions as events of perpetual development rather than static processes that exist in between of subjects that exhibit mutable behaviour. "Basically what this entails is seeing society as a communicative network in which participants are engaged in a ceaseless interpretive exercise to maintain some sense of order and identity. In this respect, society is never at rest - it is always in the process of being produced in interaction. At any one time the members of groups, collectivities, or institutions create and produce the conditions of their membership" (E. Craig, 1998, p. 8415).

Although symbolic interactionism is strong in that it provides an interesting basis to explain the establishment of meaning, it also has its weaknesses. Within the sociological epistemic field, symbolic interactionism is criticised[96] for being vague in its theoretical positions and to some extent unsystematic in its research methods (Reynolds, 1990). These objections, combined with the fairly narrow focus of interactionist research on small-group interactions and other social psychological issues, have relegated the interactionist camp to a minority position among social researcher. But symbolic interactionism often is seen as a replacement of the functionalist models and has been adopted, by many social researchers. Today interactionist ideas are incorporated into studies of the self, groups, roles,

[96] Particularly during the 1970s when quantitative approaches to sociology were dominant.

organisational research, politics and social analysis and thus play an important role in the analysis of communication and collaboration.

4.5.2 Social Constructionism

Social constructionism (or *social constructivism or anti-essentialism*) is considered the social and epistemological theory of knowledge that considers how social phenomena, and in extent reality interpretation, are developed in social contexts. Its main focus is to uncover the ways in which individuals and groups participate in the creation of their perceived social reality. It contends that categories of knowledge and reality are actively created by social relationships and interactions. Such a socially constructed reality is seen as an ongoing, self-motivated process, replicated by individual participants who act on their interpretations and their knowledge of it (P. L. Berger & Luckmann, 1966). Obviously, the core of social constructionism is found in neo-Kantian theory of perception where social participant's perception is believed to be structured by concepts and representations that are socially constructed rather than inherently developed or predefined (DeLanda, 1999, p. 30).

Against the objectivist conception of scientific invariability of laws, social constructionism argues that our scientific explanations are constantly changing in accord with discoveries in science, shifts in intellectual fashions and mutating paradigms of knowledge and inquiry. Thus, following the sociocultural beliefs, social constructionism supports that there is no absolute objectivity, knowledge and truth independent of our conceptual scheme. All of knowledge is formatted under the assumption that it does not reflect any metaphysically transcendental realities but is contingent on convention, human perception, and socio-cultural experience. In other words, all discourse is socially constructed and subject to change and modification (Best & Kellner, 1997) as it will never be able to 'come in contact' with an absolute but inaccessible nature of the Real.

Many, in the postmodern tradition, consider social constructionism and its trans-historical and non-rationalist kernel, a critical theoretical position of any essentialism, realism, traditional rationalism and objective empiricism (P. L. Berger & Luckmann, 1966) and therefore it is often seen as a source of the postmodern discourse and a critiquing mechanism to the binary logic that governs modern social theory. The main focus of social constructionism is to reveal the ways in which participants collaboratively construct their perceived social reality thus involves looking at the ways social phenomena are created, institutionalised, and made into tradition by humans. Consequently, socially constructed reality is seen as an ongoing, dynamic process, reproduced by people acting on their interpretations and their knowledge of it.

Social constructionism holds a diverse array of theories and beliefs and it can generally be divided into two major camps: *weak social constructionism* and strong social constructionism. Exponents of the weak social constructionism tend to accept some underlying objective factual elements (material reality) beyond the socially constructed reality. S*trong social constructionists on the other hand* take for granted that reality is strictly socially constructed as the notions of 'real' and 'unreal' themselves are social constructs. They support that the question of reality itself is a matter of social convention.

As we have seen in this section, social constructionism questions the independent world, accepted knowledge, essentialism and realism. But evidently social constructionism has its very own problems concerning its adaptation in contemporary epistemology (Hacking, 2000). Its dismissal of the possibility of the existence of any material reality poses the dangers of essentialism where matter is conceived only as a result of subjectivity (DeLanda, 1999, p. 32).

Related to the radical versions of social constructionism is the idea of deconstructionism[97]. While deconstruction shows that no constructed system, method or discourse can be all-encompassing, singular and monolithic as it usually represents itself (logocentrism), deconstructionism goes even further to insist that any sense of presence is also impossible and thus pose an end to western metaphysics[98]. What deconstructionists forget is that "…everything is open to its own deconstruction", including any interpretation of deconstruction or even deconstruction itself (if someone wants to interpret it as a structured methodology or theory) (Grosz, 1995, p. 61) and thus the absolutism of a 'knowledge' for the 'concreteness of the paradoxicity' per se, leads to a nihilistic understanding of wholeness. Therefore, any radical interpretation (deconstructionism) of the Derridean deconstruction avoids the risk of presence altogether, constructionism in opposition tries to describe as much presence as it can (Latour in Ihde & Selinger, 2003, p. 41) whereas (de)construction, as described in this thesis, may be described as a network of processes and in terms of a dialectic of surface events between the

[97] Deconstructionism is a philosophical movement of radical postmodernism that emerged in the Anglo-US world and is accepted today as a not-so-careful-reading of the Derridean deconstruction (Yale school)(Fish, 2008)(Cobley, 1996, p. 11)(Norris, 2002)(Donato & Macksey, 1972). In particular, "*Deconstruction[ism] … contains within itself…an endless metatheoretical regression that can no longer be brought to a stop by any practical decision or effective political engagement. In order to use it as a basis for subversion…the American solution was..to divert it…to split it off from itself." American academics "forced deconstruction against itself to produce a political 'supplement' and in so doing substituted for "Derrida's patient philological deconstruction" a "bellicose drama.*" (Cusset, 2008).

[98] It is important here to note that Derrida's distinction between closure and end is evident in his writings. He insists that although we have reached the closure of Western metaphysics, this end could be deferred indefinitely.

actual and the fictional, the presentable and the unpresentable, the material and the immaterial, etc.

A *strict constructionist*[99] or deconstructionist approach is not to be desired, if we do not want to fall into marginalised positions, conservative ideas or relativism. In their radical versions social constructionism and deconstructionism are seen as transcendental idealisms where all descriptions of the 'natural' are seen as social constructions or completely resist symbolisation. As we have seen there is a big variety of social constructionist forms. In this thesis we make use of a 'soft' or 'weak' version of social constructionism and we interpret it in terms of a rereading of Derridean deconstruction and we claim that both should be incorporated alongside and within a more pluralistic framework of analysis. Therefore, constructionism or deconstruction of this kind is tightly bound up with the issues we have examined so far, and we deem that their analysis will assist us for the development of our theoretical framework; that tries to move beyond the logocentric and relativistic pitfalls of all previous conceptions of reality and place the inquiry within a systemic (de)constructive quasi-represenation of the present {see §5.3}.

4.5.3 Sociolinguistics and the Philosophy of language

Sociolinguistics is an important discipline within the Sociocultural Tradition of communication and collaboration and in many ways overlaps with the theoretical ideas of dialectics, pragmatics, ethnography and the philosophy of language (Meyerhoff, 2006). Sociolinguistics is the central discipline of applied linguistics and its primary aim is the analysis of the relationship of language and culture and in particular the study of their social aspects of use within different contexts. Sociolinguistics focus on the way people use language to express social class, group status, gender, or ethnicity, and it looks at how they make choices about the form of language they use. It also examines the way people use language to negotiate their role in society and to achieve positions of power. The dynamics of conversations and dialogic discourse can be analysed to reveal both cultural conventions and individual speech strategies. *"The negotiation and manipulation of power and powerlessness, status and stigma, consensus and conflict are all matters for analysis within sociolinguistics"* (Llamas, 2006).

Since sociolinguistics is an empirical scientific discipline its methodological inquiry is twofold. In the firstly it tries to encompass everything that is related to language and its uses:

[99] A conservative type of constructionism (often used in American political discourse in terms of legal or constitutional interpretation)

> *"… from considering 'who speaks (or writes) what language (or what language variety) to whom and when and to what end' (Fishman, 1972, p. 46), that is, the social distribution of linguistic items, to considering how a particular linguistic variable (see above) might relate to the formulation of a specific grammatical rule in a particular language or dialect, and even to the processes through which languages change."(Wardhaugh, 2005, p. 17)*

Secondly it also seeks to examine the possible relationships between language and society. Thus, sociolinguistics provide an important vehicle for understanding and rethinking social formations (Marshal, 2004).

The *philosophy of language* is closely related to the discipline of sociolinguistics and is based on the philosophical assumption that the meaning of language depends on its actual use (Wittgenstein, 1981). The main themes of the discipline are the nature, the origin and the usage of language in everyday social interaction. Language, as used in everyday life, is considered a *language game*, primarily because social actors follow linguistic rules to produce meaning (give orders, ask or answer questions, describe situations, etc) while its practical usages are defined as *speech acts* (Austin, 1962). These language games often have different rules in different settings and their usage is considered an *act* of stating, questioning, commanding and promising among others.

Sociolinguistics and the philosophy of language are both important disciplines in the Sociocultural Tradition and influence the analysis of communication and collaboration in terms of language and culture analysis. Of particular interest is also their contribution, by the application of sociolinguistic methodologies, to the study, the design and the development of computer mediated communication and collaboration systems (Androutsopoulos, 2006) and in HCI in general (May, 1991). It can be argued that there is a bidirectional influence in these fields of research: that computer mediated communication and collaboration research provides a new empirical arena for various research traditions in sociolinguistics while conversely, sociolinguistics contribute to the interdisciplinary theorising of computer mediated communication and collaboration systems by demonstrating the role of language use and linguistic variability in the construction of interpersonal relationships and social identities that emerge because of the modern communication and collaboration technologies and applications (networks, internet, groupware, collaborative platforms, social networks etc.).

4.5.4 Ethnography and Ethnomethodology

Closely related to linguistics, systemics and cultural and social anthropology (Malinowski, 1984), *ethnography*[100] is an observational approach (or a method) that falls within the Sociocultural Tradition for the analysis of communication and collaboration (Saville-Troike, 2002). By way of clarifying what ethnography is, researchers often contrast between two definitions: a qualitative research as a whole (big ethnography) and 'ethnography-as-fieldwork' or 'field research' (little ethnography). A definition of 'little' ethnography is suggested, and is outlined as follows:

> *"Ethnography is the study of people in naturally occurring settings or 'fields' by means of methods which capture their social meanings and ordinary activities, involving the researcher participating directly in the setting, if not also the activities, in order to collect data in a systematic manner but without meaning being imposed on them externally."(Brewer, 2000, p. 10)*

Thus, ethnography's primary focus is to observe how actual social groups come to build meaning through their linguistic and non-linguistic behaviour, in their everyday communicative and collaborative actions (an approach of social inquiry). In general, ethnography tries to describe the results of an all-inclusive research method founded on the idea that (observed) system's properties cannot necessarily be accurately understood independently of each other. Its aim is to provide an account of a particular culture, society, or community while in terms of communication and collaboration its focus is to look closely at the communicative and collaborative forms that are used in specific social assemblies.

Ethnographers are participant observers, and therefore, the ethnography-as-fieldwork usually involves them spending time within the actual context that the research is taking place. The approach involves participation in events that take place in the field of study; primarily because it is assumed that this activity of participation helps understanding local behaviour and thought and consequently provides valuable information (or meaning) for the analysis of the context at hand. Several academic disciplines, in particular the constructivist and relativist paradigms, employ ethnographic research as a crucial research method.

[100] (Greek ἔθνος ethnos = people and γράφειν graphein = writing) is a genre of writing that uses fieldwork to provide a descriptive study of human societies

Lately, ethnography is also engaged for the study of information systems development, and in particular communication and collaborative computing systems, primarily because of its descriptive power. As Crabtree put it:

> *"Rejecting the use of theoretical frameworks and insisting instead on a rigorously descriptive mode of research, the approach is considered to provide a valuable means of analysing the social circumstances of systems usage, the latter being a factor that an increasing number of {systems} designers identify as crucial to successful systems development. The 'turn to the social' in systems design recognises that computers are employed within situations of human interaction and collaboration and that the work systems need to support is, as such, essentially social in character. Placing unique emphasis upon the observation and description of interaction and collaboration within natural settings, in contrast to within laboratories , ethnography is an approach that brings a real world , real time social perspective on work to bear on systems design." (Crabtree, 2003).*

But ethnography is not accepted in the world of research and academia without its critics. The two major forms of criticism for ethnography originate from nearly contradictory ideological directions: the natural science's scientific conservatism and the postmodernism. The first, derive from advocates of the natural science model of social research, and consider ethnography merely parasitic to the serious scientific standards of quantitative research (a non-science). The main argument supports that if participant observation is used in data collection, ethnography can involve introspection, or what Adler and Adler in their "Observational techniques" (Denzin & Lincoln, 2003, pp. 97-98) call auto-observation, whereby the researcher's own experiences and attitude changes while sharing the field has become part of the data, something criticised since Francis Bacon as being unscientific. Other issues concern the methods of data collection, meaning acquisition and production etc. (Brewer, 2000, pp. 19-24).

The postmodern critique presents four major issues for ethnography: attacks its representation of the field, the value it places on 'thick description', the reliability and validity of its data and the construction of the ethnographic text. The postmodern critique mainly aims to criticise the historical moment (called "the crisis of representation" in ethnography) where ethnography claims that it can provide universally valid knowledge by accurately capturing or representing the nature of the social world (Atkinson & Hammersley, 1994) (Richardson, 2003). In addition, the postmodern critique also comments upon the legitimacy of ethnographic approaches (crisis of legitimation). *"Inasmuch as ethnographic descriptions are partial, selective, even autobiographical in that they are tied to the particular ethnographer and the contingencies under which the data were collected, the traditional criteria for*

evaluating ethnography become problematic, as terms like 'validity', 'reliability' and 'generalizability' are deconstructed" (Brewer, 2000, pp. 24-25).

But both critiques are not without value for ethnography and they evidently offer important changes in the approach. The first provides valuable means for the modification of the systematicity of data acquisition and the enhancement of the observational techniques of ethnography while the postmodern critique, 'mutates' original ethnography to a '*postmodern reflexive ethnography*' which supports that although there is an ideological construct behind ethnography, this is not to be seen as a constraint that limits research and practice or aims to provide a 'grand-narrative'. Their ideas compared to natural sciences and radical postmodern approaches can be summarised as follows:

> *"…ethnography should be rigorous and systematic, but science is not held up as the model, and while ethnography is still seen as suited to satisfying the interpretative and humanistic injunction to study people in natural settings, its knowledge is not privileged and unproblematic. Drawing on social studies of science, these ethnographers point to the fact that the natural science model of social research fails to meet its own standards. As Dey (1993: 15) argues, all data, regardless of method, are 'produced' by researchers, who are not distant or detached, since they make various choices about research design, location and approach which help to 'create' the data they end up collecting. Thus, it is claimed, all research is subjective, in that it is personal and cultural, including science (Hammersley 1990: 9). These ethnographers question the ability of any method to represent 'reality' accurately on three grounds: there is no one fixed 'reality' in the postmodern understanding of nature to capture 'accurately'; all methods are cultural and personal constructs, collecting partial and selective knowledge; and since all knowledge is selective, research can offer only a socially constructed account of the world. These ethnographers appropriately turn the lens on themselves and criticize the claim that ethnography is a privileged method. This postmodern ethnographic critique of ethnography provides a serious challenge to ethnography." (Brewer, 2000, p. 24)*

In this perspective, the postmodern critique provides a serious challenge to the original ethnographic approach, but at the same time it can be argued that it provides a chance for change. In this ideological line many researchers managed to overturn the postmodern critique and use it constructively. By incorporating the aforementioned criticisms, they support that ethnography is indeed a non-privileged method, and they argue that this is not a serious reason not to practice it as an

interpretative approach (Denzin, 1994, 2000) or '*subtle realism*[101]' (Hammersley, 1991, 1992, 2007).

Ethnomethodology and ethnography are often seen as complementary to each other particularly because of their interpretative character. Hence, while ethnography primarily concerns itself with the prolonged study of participants and their activities and it involves immersion and participation within the actual context of research interest, ethnomethodology, on the other hand, studies the activities of the participants and tries to discover how they make sense of them. Ethnomethodology is thus focusing, not to analyse the activity itself but to observe the micro-behaviours that emerge in actual situations of communicative and collaborative interaction and occurs in a daily basis. As Rawls put it:

> *"Ethnomethodology, then, is the study of the methods people use for producing recognizable social orders. "Ethno" refers to members of a social or cultural group and "method" refers to the things members routinely do to create and recreate various recognizable social actions or social practices. "Ology," as in the word "sociology," implies the study of, or the logic of, these methods. Thus, ethnomethodology means the study of members' methods for producing recognizable social orders.*
> *Ethnomethodology is not itself a method. It is a study of members' methods based on the theory that a faithful dedication to the details of social phenomena will reveal social order."(Anne Rawls in Ritzer, 2003)*

Therefore ethnomethodology is an approach that also fits in the Sociocultural Tradition because it studies the ways in which people produce recognisable social orders (make sense of their world) through the use of methods, display this understanding to others, and produce the mutually shared social order as a cultural construct that can further be evaluated in other instances of the patterned analysis (Garfinkel & Rawls, 2002; Garfinkel, 1991, 1986). Ethnomethodology is an important approach in representing participants' collaboration in various design contexts. It has been particularly useful in analysing the validity of organisational accounts by the practitioners themselves rather than by abstract a priori criteria specified by analysts who have neither encountered nor considered the particular context of work (Crabtree, 2003, pp. 77-78).

[101] "Ethnographers can purport to produce knowledge that is beyond reasonable doubt, but it will never be final or absolutely certain. Thus, ethnographic texts can still reasonably claim to represent reality, but they must be explicitly identified as fallible representations and necessarily selective of the phenomena to which they refer (Hammersley, 1993)"(Brewer, 2000, p. 141).

4.5.5 Summary

Within the Sociocultural Tradition purposeful communicative activities are taking place at a symbolic level where the sociocultural patterns of "*reality {are} produced, maintained, repaired and transformed*" (Carey, 1988, p. 23) (R. Craig, 1999). In turn, the contextual reality that emerges provides the grounds for the reestablishment of a new symbolic interaction that in turn bring into life new modes of communication and collaboration. The Sociocultural Tradition in many cases is critical while in others strongly interwoven with the other traditions of communication and collaboration. Its focus in describing the sociocultural relations in social life is definitely an advantage (being descriptive) but also a drawback as it misses it self-reflexive character. When seen from a different perspective, Sociocultural Tradition's descriptive character of the social and the cultural can be supplemented by the Critical Tradition which focuses on theoretical reflexivity and thus their fusion provides a pluralistic theoretical and practical device.

4.6 Critical Tradition in Communication and Collaboration: theoretical reflexivity

The critical tradition of communication and collaboration is a significant step towards the re-evaluation of the descriptive character of all the previous traditions. Highly influenced by the paradigms that critical theories propose, the critical tradition clearly attempts to undermine the belief systems of the past and thus proposes that theoretical constructs that promote themselves as 'theories of everything' do not necessarily lead to a significant increase in understanding the ways our culture works. Therefore, the critical tradition in communication and collaboration studies does not directly promote itself as a constructionist or functionalist theoretical edifice (although it anticipates positive intervention and social change and also supports that this is only possible within sociocultural contexts), but rather, stands as a critical perspective that re-evaluates many of the assumptions of the previously mentioned traditions. Critical tradition in communication and collaboration studies, thus, shares the critical theory's recognition that meaning is neither naturally given nor immediate and therefore engages us in a state of *theoretical reflexivity* where the method of adopting a theoretical position is to be fore-grounded. In this sense, critical tradition becomes a form of hermeneutics, as in literary studies, and seeks knowledge via interpretation of symbolic expression in contexts of human interaction (Habermas, 1972). At the same time in critical social theory, the critical tradition becomes a form of self-reflective knowledge involving both understanding and theoretical explanation with purpose to eliminate the entrapment in systems of excessive power, domination or dependence.

The purposes of critical tradition, evident in all the varieties of the field, can be summarised in terms of its goals. The primary aim of critical tradition is to identify the established systems of power within a social structure and also the systems of belief

or the dominant ideologies. In particular, it tries to surface the undercurrent interests that are served because of these power relations and thus uncover the oppressive social conditions that are concealed. Its critical functioning is not without a vision and is epitomised in the search for *emancipation,* or in other words the ultimate status of social equilibrium where the scope of autonomy is expanded while the scope of domination is reduced {see §3.2.5 & 4.3}. Guided by this end, critical tradition works within a three step ideology:

- understand systems of power,
- identify oppression mechanisms and thus unveil illusions for 'theories of everything' and finally,
- act or intervene to alter the current status of oppression by bringing together theory and action in a pluralistic ideological context.

In contrast to its application and interpretation in literary studies, critical theory in social sciences has a normative behaviour and focuses in both ideological and pragmatic intervention in terms of a plural and synthetic approach. Characteristic is the thesis of many critical theorists who believe that critical tradition is to be conceived as a way *"to read the world with an eye towards shaping it"* (Pollock & Cox, 1991). In social sciences, critical hermeneutics, as critical tradition's practice is also named, aim to reveal conflicting ideologies and work in a way that the interests of marginalised groups are brought forward. In this case, the role of the critical hermeneutist is to provide the representational media (e.g., new forms of language) that will on the one hand enable the dominant ideology's weaknesses to become evident, while on the other it will qualify the competing ideologies in order to pierce their silence. The critical tradition therefore falls within several different traditions including the modernist and postmodernist paradigms. Within the modernist tradition the Frankfurt school is an important player for the constitution of the contemporary modernist beliefs while postmodern ideas span from a variety of disperse ideas including: Foucauldian epistemology {see §2.3}, Derridean deconstruction, Lyotardian grand-narratives and Lacanian psychoanalysis among others {see §5.2.1 & 5.2.2 & 5.2.3}. In this section we will focus in outlining the basic ideas of modernism and postmodernism in terms of communication and collaboration.

4.6.1 Summary

Apart from its influence in communication and collaboration, the critical tradition has to offer interesting grounds for the discussion and current status of design and design practice in general. It brings to the table the necessity of an inclusive design practice where marginalised groups and their characteristics are considered important and influential means for universal design considerations.

The field of communication and collaboration is not to be seen as a complete, coherent ideological construct but rather as Craig suggests it has the potential to

become a dialogical-dialectical field that is based on two major principles (R. Craig, 1999, p. 132): (a) constitutive metamodel of communication and (b) a conception of communication theory as a metadiscursice practice within a practical discipline that in our view can be positioned within the realm of the design practice and the design thinking. Finally we also support that in order to round off this brief exposition of the various traditions of communication and collaboration, we must emphasise to the development of a systemic observation of the most important issues that are informed and arise in their exegesis.

In short, these are considered the major tenets of the past two centuries in terms of an ontological, epistemological, praxeological and axiological understanding of reality and knowledge constitution in terms of communicative practice. In order to deeply analyse the ambivalent determination of theory and knowledge, in terms of a transitive (often circular) theorisation of reality between the foundational and reflexive paradigmatic narratives, in the following section we will focus in providing a meta-hermeneutic framework for networked interactions in contexts of a systemic (de)constructive ontological account.

5 A meta-Hermeneutic Theoretical Framework of a Systemic (de)constructive Ontology

5.1 Introduction

In the previous sections we have seen how modern epistemological conceptions lead to postmodernism and consequently stay in the middle of the variety of their major epistemological positions. There can hardly be any doubt that the conditions for describing the world have changed. Since the turn of the 20th century, at least, we have known that there is no point for observing the world that lies outside the world, but also we learnt that our observing position distorts the very image of this factual reality. Therefore today, we are in search of an epistemological 'device' of ontological validity that supports and expands our present belief about reality and its construction.

Following the aforementioned analysis regarding the argumentation of a various orientations for examining epistemological questions related to the nature of communication and collaboration, in this section, we outline a theoretical framework that (dis)places the object of inquiry within a complex network of interrelated arguments and provides an intuitive conception for interpreting the reality of communicative and collaborative action detached from the supposition that this reality is a concrete physical Real.

The self-objectification involved in modernism implicitly brings a re-subjectification that opens the door to the infinite regress that appeared in postmodern thinking. This transition from classicist absolute concreteness, to the incorporation of modernistic uncertainty, to an *apeironic,* '*hall of mirrors*' postmodern effect, is prevalent in a variety of examples in recent history of philosophical and scientific thinking as well as the socio-cultural developments of our times (Rosenau, 1992)(Best & Kellner, 1997)(Rosen, 2004)(Hallward, 2003)(Badiou, 2007)(Meillassoux, 2007a, 2008). It is palpable that these philosophical positions are constraining our conception of the nature of the real, on marginalised teleological postulations of concrete Reality. We get enmeshed in a paradoxical perpetual mirror play, because we try to gain closure on transcendent totalities of purely conceptual positions. In these approaches every postulation of totality brings its denial, since our dependence on symbolic abstraction confines us to the relativistic enaction between explicate and implicate orders. Obviously, the solutions offered by modernism and radical postmodernism failed to 'liberate' us from the metaphysics of the past.

As we have seen, modernistic approaches in defining the nature of reality in terms of ontology, epistemology, praxeology and axiology, assumed causality and prediction as essential structural components to explanation. Radical postmodernism on the other

hand just reversed modernistic metaphysics by turning all affirmations to pure negations. Even further to this negative approximation, radical postmodernism's categorical manner was obviously reluctant to disavow the underlying singularity of metaphysics towards logical purity. So to speak, in recent Derridean negative '*theology*' and its groundless grounds (Derrida, 1995), Lyotardian radical postmodernism, Rortrian pragmatism, Baudrillardian hyperreality, Fukuyama's post-humanistic[102] '*end of history*' (Fukuyama, 1993), and Kantian correlationism, logocentrism seemed to be maintained through all the reversals and overturnings carried out by the incorporation of a radical version of deconstructive/relativistic thinking.

In order to put forward the epistemological status of these days, but also provide an ontological device for creating (not describing) the real, we propose a new revised version of an (non)antagonistic conception of interpreting reality, influenced both by the modernist and postmodernist impulse to liberate human spirit from intellectual and cultural constraints, although this is not a possible task. The revised version of (de)constructive thinking influenced by the early Derridean thought, Lacanian psychoanalysis, and the socio-technical account of Actant-network theory, completely dismiss any parallels to the logocentric pitfalls of modern/structuralist and postmodern/post-structuralist paradigms. Based on these ideas, this section considers the necessary epistemological presuppositions for such a theoretical framework that goes beyond the shortcomings of the any radically foundational views.

In the subsections that follow we outline a series of concepts that progressively and additively build our epistemological account of (de)constructive ontology in which both material-interaction couplings and meaning-mediated interdependencies in the action of (human, and so also nonhuman) participating entities/processes, are taken into account[103].

In particular the subsequent sections provide an appreciation, an outline, and an assessment of the most influential theoretical issues and thereupon propose the constitution of a (de)constructive ontology and are hierarchically structured as follows:

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[102] In expanding his essay '*The end of history?*', Fukuyama argues that the advent of Western liberal democracy may signal the end point of mankind's ideological evolution and the final form of human government (Fukuyama, 1989). Later on he conceded that his thesis was incomplete, but for a different reason: "*there can be no end of history without an end of modern natural science and technology*" (Fukuyama, 2003). He predicts that humanity's control of its own evolution will have a great and possibly terrible effect on the liberal democracy.

[103] Both material couplings and meaning interdependencies are considered are processes that exist and produce evental sites.

A short overview of the most influential modern and postmodern theories not analysed elsewhere:

- Narratives and meta-narratives {see §5.2.1},
- Deconstruction {see §5.2.2},
- Psychoanalytic theory of Lacan {see §5.2.3},
- Science in socio-technical contexts and Actant-Network theory {see §5.2.4}.
- An understanding of causation and the emergence of meaning in contexts of interactive communicative and collaborative practice {see §5.2.5},
- Correlationism and Speculative realism {see §5.2.6}.

5.2 Modern, Postmodern and Contemporary Theories of Significant Influence

To recapitulate the analysis of contemporary thinking, as presented in the variety of paradigms mentioned in the previous sections, a brief 'précis' is provided in this section, regarding the basic characteristics of the theoretical constructs that developed by the major structuralist, modern, post-structuralist and postmodern thinkers. These ideas share a characteristic philosophical position which is in conflict with many of the concepts in structuralism and modernism. As it will become observable, most of them question the status of scientific practice, as presented since the Enlightenment, and provide interesting arguments (against and in favour) for the possibility of knowledge and meaning production within the limits of language, context, discourse and sociocultural milieu among others. Their thesis is of interest primarily because they provide a novel theoretical interpretation of knowledge, and the construction of reality that in turn provides new grounds for argumentation for the possibilities of subjective and social transformation. Therefore, in order to provide an overview of the most significant similarities and differences between the modern and postmodern traditions we briefly analyse the following theories that are considered eminent in any attempt to portray the philosophical status of the present day and also provide a short discussion regarding their use and value in this thesis.

5.2.1 Narratives and Meta-narratives

Lyotard is considered as the leading meta-theorist of postmodernism and the one who popularised the term 'postmodernism' within philosophy and social sciences through his work "The Postmodern Condition: A report to knowledge"(Lyotard, 1984). In his book he introduces "postmodern science" via the documentation of the differences between the grand-narratives of philosophy and social theory. He identifies that traditional modernist modes of philosophical and scientific inquiry championed the heterogeneity of knowledge claims and concluded that the postmodern discourse should seek to 'search for instabilities' on those concrete metanarratives. He supports the idea that the emergence of plurality of epistemologies should become the basis of postmodern science but rejects the desire for a unified and privileged scientific totalising stability. This epistemology represents

knowledge as 'a variety of discourses' each supporting its own domain. These domains are locally defined by their own particular criteria and no domain is privileged over another.

In his definition of postmodern knowledge Lyotard argues that new and innovative ideas should be incorporated, thought antithetical and provocative to any dominant scientific beliefs. Postmodern knowledge is distinguished by a type of creativity that *"refines our sensitivity to differences and reinforces our ability to tolerate the incommensurable. Its principle is not to the expert's homology, but the inventor's paralogy"* (Lyotard, 1984). In this sense Lyotard suggests that the definition of a new paradigm of scientific knowledge will inevitably involve the construction of another metanarrative, so what he has to offer is an idea of practicing theory. He suggests that in exercising science we are only involved in a social action for the definition of new domains or language-games. In fact we are involved in a continuous social interaction for the creation of new meaningful structures for the purpose of the continuation of this 'game' and our participation in it. According to this position, no opponents compete and the annihilation of the other is unimportant. What we try to do is to maintain a state of continuous 'difference' in order to motivate social action (Cooper & Burrell, 1988).

5.2.2 From Deconstruction (Derridean) to (de)construction

> *"When a deconstructive analysis interrogates an apparent unity — a poem, a manifesto, a sermon, a procedure, an agenda — and discovers, as it always will, that its surface coherence is achieved by the suppression of questions it must not ask if it is to maintain the fiction of its self-identity, the result is not the discovery of an anomaly, of a deviance from a norm that can be banished or corrected; for no structure built by man (which means no structure) could be otherwise."(Fish, 2008)*

Derrida's works have proven to be particularly important but also controversially interpreted to the study of the ways in which language constructs our awareness of ourselves and the natural and social world we inhabit. Derrida's theory of the sign fits into the post-structuralist movement[104] and therefore, is founded upon the refusal of the latter to accept the idea of structure and substance as in any sense given or metaphysically 'existent'. Thus, deconstruction aims to question conservative

[104] Deconstruction had attained widespread, often averse, recognition as the newest avant-garde intellectual movement in France and America. For many years it is believed that it remained firmly post-structuralist and post-phenomenological primarily because of its Freudian and Nietzschean heritage.

structuralism, which originated in the time of Plato and established by the Saussurean structuralism that maintained logocentrism in the modern era.

Derrida's task is to disrupt, rather than reject, the entire stream of metaphysical thought, established on supposedly purely existing binary oppositions, by dismantling the very bases of interpretative method and meaning. His theory of *deconstruction* (a theory of discourse) challenges the idea of stable structures and advances the argument that there is *no structure or centre, no univocal meaning*, but only processes of perpetual development that are based on differentiation and deferment. For deconstruction the structuralist notion of undeviating relationships between signifier and signified is no longer considered tenable. Instead, infinite shifts in meaning relay from one signifier to another, transferring own interest from substance understanding to process interpretation throughout a continuous mode of representation analysis.

In interpreting the socio-linguistic context of deconstruction we make several assumptions in approaching Derrida's work, most of which are shared with other readers of the Derridean project (Bennington & Derrida, 2007) (Norris, 2002). This thesis is attempting to re-interpret the Derridean project of deconstruction in the light of an ontological grounding of the processes of semiotic differentiation and deferment and thus, similar to (Colm, 2008), to provide a framework for understanding collaborative activities within a symbolic network of interactions. Before addressing the topics that relate our view with the Derridean ideas, we consider necessary to offer an overview, of some preliminary issues related to his work that will eventually lead us to the constitution of an ontological framework of (de)construction.

Based on the concept of 'difference' Derridean postmodernism is founded on a deconstructive approach which illustrates how apparent, rather than actual, are the normative structures of the world we experience. Derrida revised Heidegger's 'destruction of [traditional] ontology' as a deconstruction of orthodox rationality. In its basic formulation 'deconstruction' (Derrida, 1976) denotes a methodological strategy which attempts to uncover layers of hidden meaning, which have been denied or suppressed, in a 'text'. The term 'text', in this respect, does not relate to a written form of communication, but refers to meaningful language structures that are produced and reproduced continuously in everyday social relations, be they spoken written or embedded in the construction of material artefacts. Influenced by (Heidegger, 1976), Derrida believes that 'text' shapes 'a reality' of what we experience as 'world' ("language shapes us") and therefore, a 'text' is a quasi-representation of a (con)text. The power of the text derives in part from what he calls "différance": the play of meaning between textual levels. The 'text' refers both to the relationship of cultural discourses, namely political, social, philosophical, scientific

etc., and the domain upon which the practice of deconstruction is constituted (Cooper, 1989). In this sense, deconstruction does not only focus in unveiling marginalised views but also to deconstruct the context within which it emerges.

Following this, the mental process of 'logocentrism' - primacy of a term in binary opposition or definition of rational language, e.g., language over text, thought over language, good/bad, culture/nature, rational and irrational etc.- is devaluated. In any statement oppositional terms differ from each other and at the same time a hierarchical relationship is maintained by the deferral of one term over the other (Hancock & Tyler, 2001). In order to deconstruct an opposition the initial state is to 'overturn' the hierarchy at a given moment, by focusing at the suppressed term and simultaneously being careful not just to reverse the hierarchy (Normal/Abnormal, Abnormal/Normal). The relationship between the opposing terms is in fact one of mutual dependence in which each term 'inhabits' the other. To avoid this, Derrida suggests a second step of 'metaphorisation' that helps to surpass regression of structure opposites in the deconstructive process. According to this process of metaphorisation, monadic terms that look alike, undergo a procedure of transformation, which 'sees' them to combine in a continual exchange of ambivalent characteristics. This course of 'aporia' motivates the dynamic of metaphorization and becomes a vehicle for meaning transportation in which the creator/observer is carried along. Thus, meaning is never fixed whatever the intention of the participants, creator, or observer (e.g., author and reader, designer and user).

In this sense, philosophical inquiry depends upon the very techniques it incorporates and thereby fails to realise the ideal of merely communicating the logic of ideas. Established on this postmodern view, Derrida's work support that knowledge and discourse have to be constructed from a 'chameleonic' world (Cooper & Burrell, 1988), core ideas or arguments are not privileged and are not considered as important.

Therefore, it can be supported that the Derridean inhabitance of the regress is not a purity towards a negative one-sided stance. Derrida is not seeking a pure negation but a paradoxical presence-absence relationship that although it obviously liberates us from the modernist metaphysics it is also possible to engage us in new age metaphysics of infinitism/relativism[105] that need to be tamed. But Derrida's

[105] It is argued that it's not impossible for an infinite justificatory series to exist (P. Klein, 1999). This position is known as "infinitism". Infinitists typically take the infinite series to be merely potential, in the sense that an individual may have indefinitely many reasons available to him, without having consciously thought through all of these reasons. The individual need only have the ability to bring forth the relevant reasons when the need arises. This position is motivated in part by the desire to avoid what is seen as the arbitrariness and circularity of its chief competitors, foundationalism and coherentism.

scepticism is not what some of his interpreters would make of it, a passport to limitless interpretative games where 'anything goes' (Norris, 2002, pp. 124-133). Instead deconstruction or *(de)construction* is to be seen as a long a strenuous process of studying (con)texts and their processes. (de)construction is a discipline of close study of any monolithic view of contextual realities that ostensibly denies the power of any language, including its own. Is a process that encompasses the dismissal of any end towards absolute meaning, logic, truth and the very possibility of 'purely' communicating such notions. Nonetheless, (de)construction accepts the temporal actuality of assemblages and processes within a network of relations. The actual is thus not a permanent structural substance but rather a non-originary origin, a self-differentiated supplementary entity that continually exists in a network of relations. (de)construction follows the Derridean disbelief for single determining causes, accepts the trace-like play of differential meanings (Lucy, 2003), but at the same time attempts to deconstruct "all the way down" without posing any metaphysical centre. To achieve this it incorporates an epistemological account of a "flat ontology" where all entitles deprive structure and develop within a processual network of interactions.

5.2.3 The Psychoanalytic Theory of Lacan

From their Freudian foundations, the psychoanalytic accounts inform us that no observation is 'innocent' and, thus, focus in primarily involving the observer in the observed process (a similar conception to second order cybernetics). Along with this conception, psychoanalytic theories offer a highly anti-essentialist semiotic framework for understanding and analysing the subjective, the social and the real.

The psychoanalytic theory of Jacques Lacan is an interesting device for describing the interaction of the subject[106], the socio-symbolic, and the material, primarily because it is a synchronic scheme of a-causal emergence and secondarily because it promotes the disavowal of sublime interpretation (of the analyst). The way that Lacan describes phenomena is a mixture of structural and processual characteristics with emphasis on the confluence and the dynamically dependent character of any defined structures. The theory not only constitutes a particular aspect of the mental life of 'intentional' subjects, but also corresponds to a network of relations for the development of agency within a social and material reality. The most important idea in the Lacanian psychoanalytic theory is the tripartite relationship of three orders: the Imaginary, the Symbolic and the Real. The three orders define themselves in terms of negative relationships to each other yet never come to a point of 'completeness' at which each

[106] The Lacanian subject is defined differently compared to the Western conception of the term. For a more detailed analysis, the reader should refer to the following paragraph 'Subject and ego' in subsection {see §5.2.3.1}.

is subsumed by the others to produce a clear, pure, and comprehensive synthesis. The simplest way to describe the three Orders is to represent them as 'confluence areas', which filter every mental or social act. Furthermore, as the expression 'Order' suggests, these Orders relate subjective experience of the real with its symbolic socially defined experience (Lacan, 2001) [Figure 5-1].

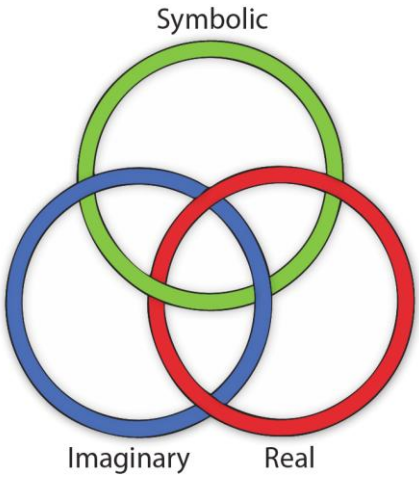

FIGURE 5-1 – LACANIAN THREE ORDERS - BORROMEAN KNOT

The Order of the Imaginary

The Imaginary Order is denoting the process for the formation of the 'ego'. Therefore, the ego is an imaginary function that is not to be confused with the subject. This process of 'ego' formation is often called 'the mirror stage'. This 'mirror image' offers to the ego a way to constantly undermining the unity and integrity it seeks to impart. Therefore, in order to exist as a unity one has to deconstruct his own unity. Imaginary, thus, specifies an unceasing search of the self, is a process of emergence that attempts to combine the various instances of reproduction of the fragmented self to the myth of the unity. Therefore imaginary (or the little other) is an illusory state, an obsession of the self with an image of itself.

The Order of the Symbolic

The Symbolic Order (the big Other) refers to the what we might call 'symbolic reality'. It is the 'objective' world as it is signified by communal language, it is the site of constant development which collects the unconscious and the otherness that remain as other. According to the structuralist conception it forms a language that 'speaks for' (the dimension of the signifier) the subject, or in other words it forms a relational system of signifiers. The symbolic is established by a signifying chain that forms its language and therefore constitutes it as a socio-linguistic reality of communicational processes, intersubjective relations, and awareness of ideological/symbolic protocols. The symbolic dimension of language is the realm of the signifier and thus no positive existence of an absolute and concrete real can be assumed. What exists in the

symbolic world of language is constituted purely by virtue of its difference with other symbolic elements and thus it forms the realm of culture.

Because of its emerging character, the symbolic is essentially the order of pure alterity, the order where communication events take place through language games. For that reason, the symbolic order remains an autonomous domain at all times regardless of its relation to the real. It can be said that the symbolic order is a network of relations with the subject and thus the most decisive order of incorporating the observing analyst to the system of analysis; it is considered that (psycho)analysts are essentially 'practitioners of the symbolic function'.

The Order of the Real

The Real refers to the state of reality that resists symbolisation. Lacan argues that the Real is *ineffable* and *impossible* to capture in any reasonable way (impossible to represent in terms of the imaginary and to inscribe in any symbolic system), and therefore he proposes that the main qualities of the Real are unpresentable and unsymbolisable. According to (Myers, 2003, p. 25) the *"Real is the world before it is carved up by language"* and thus is revealed in terms of the failure of its symbolisation. According to (Zizek, 1997) the real is not an ultimate referent of external reality, but the boundary which obstructs the detached representation of an external (symbolic) real. The Real continually eludes its own symbolisation and is always already there, as a think-in-itself that poses a limit to any type of absolute representation.

Compared to the Symbolic, which is a set of differentiated and discrete elements that are called signifiers, the Real is undifferentiated. According to the Seminar Lacan gave in 1954-1955, "*the real is absolutely without fissure"* (Lacan, 1988). The relation between the Real and the Symbolic rests in the process of signification and it is the Symbolic which by cutting through the Real it 'creates' the relationship with it. Following this conception, reality is not only a result of an imaginary process as in traditional structuralism, but also is 'constructed' through and beyond its relationship with the Symbolic. When opposed to the Symbolic, the Real is does not uphold an absence nor the possibility that something is to be signified in order to exist. As Lacan points out, there is no absence in the Real (Lacan, 1988, p. 313). The Real is what connects Lacan with materialism, primarily because of the implying material substrate that is missing from the Imaginary and the Symbolic.

Lacanian theory, based on the tripartite of the Imaginary, the Symbolic and the Real, disrupts any type of homogeneity that might exists in an objective level of reality but at the same time it forms an ontological understanding of signification primarily because of its relation to the order of the Real, which in itself is external to any level of constructivism or constructionism. Because this Real does not exist in the sense of

being sufficiently represented, to become an absolute real, it provides an ontological account that, by disrupting and changing reality, it is also creating it. For this reason, Lacanian theory develops to a quasi-representational framework.

5.2.3.1 Ontologising the inter- and intra-subjective

The psychoanalytic Lacanian theory offers the possibility to ontologise the deeply hidden behavioural processes of the social subject as well as to horizontally relate these to an inter-subjective social interaction. The important issues of the Lacanian theory, which are connected to the development of such an ontological framework, derive from the aforementioned three Orders and include the following.

Ego and Subject

The 'ego' is the result of the interaction of the 'specular image'[107] in the 'mirror stage' of development and the 'counterpart' [Figure 5-2]. It is the stage that the subject becomes fragmented by transforming his own self into a 'counterpart'[108] influenced by the 'specular image'. The combination of these two notions form the 'little other' (denoted as á), the other that designates an alterity within the ego. This 'little other' exists sorely in the Imaginary order and is the other who is not really other but is the coupled symbolic other of the ego. In the process of signification within the ego, 'ego' and the 'little other' are in a perpetual state of semiotic exchange.

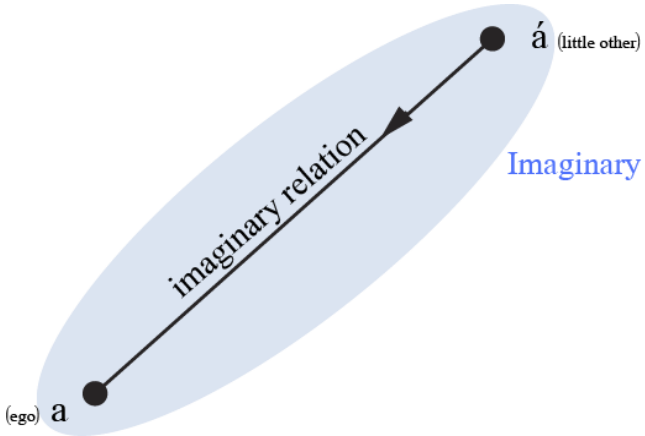

FIGURE 5-2 – IMAGINARY RELATION

The Lacanian subject is not the individual of the Western tradition (Fink, 1996, p. 35). Lacan distinguishes between the subject and the ego. Whereas ego is part of the

[107] The 'specular image' is the result of an actual process of identification of the ego's own reflection in the mirror (i.e., mirror refers to all means of speculation deriving from the relation of the Imaginary with the Symbolic).

[108] It is an alienating process attaches himself to an Imaginary structure, an image of himself in the other.

Imaginary order, the subject is part of the Symbolic. In this sense the subject is not simply equivalent to a conscious sensible agency but is closely related to the unconscious.

If we take away all distinctive characteristics, all particular needs, interests and beliefs what we are left with is the subject. In this sense the subject is the '*form*' of self-consciousness and is opposed and distinct to the contents of consciousness which are specific to the individual. The subject exists between nature and the beings immersed in it. And so to speak, subject forms the 'missing link', or as Zizek calls it 'the vanishing mediator' (Zizek, 2002), between the state of nature and the state of culture. The subject is the 'void' between the signifier (nature) and signified (culture) [Figure 5-3].

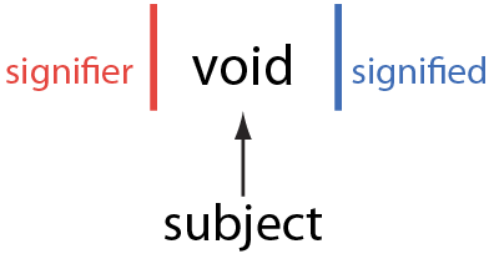

FIGURE 5-3 – LACANIAN SUBJECT

This void space and its boundaries (signifier/signified) is the place where subjectivity emerges; it is not 'nothing' but the opposite of everything. It is the 'mechanism' or the transitory device that functions as a negation of all determinacy; it is the creative cogito who is responsible for bridging the object with the representation.

The Lacanian subject is not a pure subject existing in the Real but it is essentially a fragmented subject that is produced by the unconscious, is related to symbolic 'barred Other' (which is denoted by $\mathbb{A}$) and in Lacan's conception it is a 'barred subject' [Figure 5-4]. While this 'barred subject' $\mathbb{S}$ is the result of the division of the subject by language, the 'barred Other' designates the incomplete Other because of the 'lack' in the Symbolic. Both 'barred subject' and 'barred Other' are dynamic concepts that 'exist' in a perpetual state of development and are opposed to the Western metaphysic's 'subject' and 'Other', which places in the Real and assumes that cannot be absolutely known, namely because they resist symbolisation.

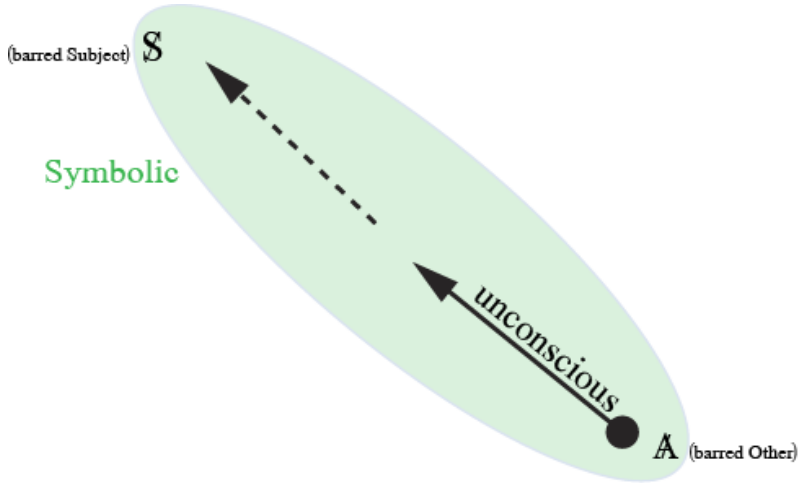

FIGURE 5-4 – SYMBOLIC RELATION

'Schéma L' and 'Button-tie Schéma'

Lacan develops a series of graphemes (and schemata) in order to formalise his ideas regarding the relation of the Symbolic, the Imaginary and the Real and places in them the notions of the 'ego', the 'little other', the 'barred subject', and the 'big Other'. To outline the process of subject development within a symbolic network of interactions, Lacan introduces '*Schéma L*' in 1955 [Figure 5-5] (Lacan, 1988, p. 243)(Lacan, 2001, p. 40).

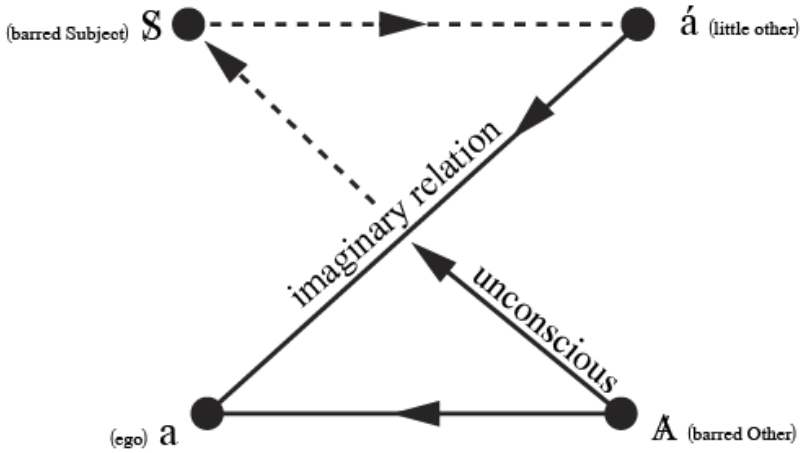

FIGURE 5-5 – SCHEMA L

The main purpose for the introduction of this schéma is to demonstrate the hypothesis of the dialectic between the subject and the Other. This schéma presents the so called inter-subjective dimensions of social interaction and it is perhaps the clearest exposition of the decentered subject (Milovanovic, 1995). This four-cornered schema proposes two diagonally crossed axes. The first represents an unconscious/symbolic axis (Symbolic relation) while the second the imaginary axis

(Imaginary relation). In this schema subject is drawn over all four corners and is simultaneously caught in the working of the symbolic and imaginary axes. Meaning formation in the Symbolic is presented through schéma L by the 'barred Other' and enters the subjective realm via the unconscious. This refers to the symbolic transference, from the 'barred Other' to the 'barred subject', that is always blocked by the imaginary relation of the 'ego' and the 'little other'. This imaginary relation constitutes the symbolic 'wall of language' that distorts the symbolic meaning before the latter reaches the subject.

In addition to schéma L, Lacan introduces the 'button-tie schéma' and in 'Graph 1' of this he explains the formation of social meaning in terms of a relationship between the 'barred subject', the living organism (pre-subjective, pre-linguistic in vegetative state individual) (Lacan, 1968). In this schéma, Lacan deconstructs the Saussurean structuralist signification by inserting the role of the 'barred subject' and thus, questioning the meaning making process. This is a similar conception to the Peircean semiotics of the object, the representament, and the interpretant (split subject and living organism). Lacan, with the 'button-tie schéma', ties together the signifier and the signified on the 'fabric' of language (and speech). Lacan supports that the signifier and the signified are not anchored to a metaphysical external reality or referent, but are in a continual state of redefining their intersection with the subject. In 'Graph 1' the social construction of meaning 'ties down' the subject on the process [Figure 5-6]. The subject becomes fixated and, at the same time, 'freed' within the limits of the expanding language. This is a twofold process of 'meaning creation' that limits the subject by delineating the boundaries of the emergent language of the symbolic network.

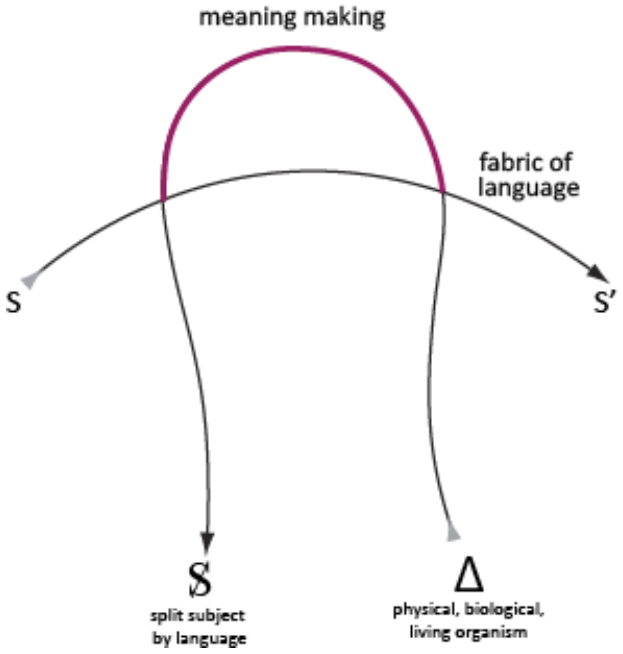

FIGURE 5-6 – BUTTON TIE SCHEMA - GRAPH 1

The analyst in the schemata

Lacanian theory is of practical importance in explaining the ways an analyst/intervener/actant intervenes in the symbolic order in order to influence the network of interactions/connections that take place there. In this way the analyst organises the network around him/her/it and thus produces new dynamics in the network.

5.2.3.2 Summary

The psychoanalytic theory of Lacan is an informative theoretical account for understanding the relational character of subjectivity and social action. The subjective here is no longer 'subjective' in the essentialist sense of the word which presupposes the identification of the subject with the conscious rational ego. Rather the subject is always connected to the inherent lack which is attached to the root of human condition. Nontheless, one must not assume here that the subject is to find the absolute meaning in its interaction with the socio-symbolic. Lacan's psychoanalytic theory does not resemble the social constructionist theory. Instead it supports the incompleteness of the socio-symbolic and thus proposes that absolute representation is the representation that resists symbolisation. *"The field of representation is itself revealed as lacking because it attempts the impossible, that is to say, the representation of something ultimately unpreventable"* (Stavrakakis, 1999). Therefore the symbolic Other is not the utopian realm where all answers exist. As Lacan rightly said there is something missing in the Other, "there is no Other of the Other" (Lacan, 2001). Hence the social is revealed as a discursive field of representation which is articulated on the basis of the exclusion of the unpresentable real.

What remains to be presented is the basis upon which we should build our foundations for establishing a dialectical understanding of the relation of interpersonal collaboration without losing the intra-subjective element that Actant-Network theory or other ontological theories assume as superfluous. In our conception for the establishment of an ontological theory reality is threefold and therefore relies on a single-sided surface that connects the Imaginary with the Symbolic and the real. What we propose to happen on this network of interconnected orders is a perpetual meaning-making process that does not assume any stable structures, but, processes of inconsistent character. Thus, we remain faithful to the dictum stated by the German poet Paul Celan: "*build on inconsistencies.*"

5.2.4 The mode of science

In this section we outline the basic tenets in understanding the relationship between science and technology, and therefore, we provide an overview of the most influential studies for the development of science and technology in terms of socially distributed processes. Our purpose is to understand the ways of knowledge production as a networked process.

As we have seen in {see §0} {see §2.3}, knowledge and its production can only be understood within a paradigm, but our contemporary research in the area, proposes a different set of conditions under which science and technology dynamically develop. This is based on the idea of a networked mode of production that distinguishes itself from the previous modes of knowledge production, which included ideas, methods, cognitive models, rules and social values that derive from the positivist tradition of scientific practice. An example of this shift can be described in terms of the work of (Gibbons et al., 1994) who support that the 'Mode 2' (a new language of research) should derive from an extended context of research environments. This turn is of major importance mostly because the collective environment that promotes the development of knowledge is based on multiple methodological tools and spans in a wide multi-paradigmatic environment.

Therefore, in the revised version of 'Mode 2' for reflecting upon the development of knowledge, (Nowotny, Scott, & Gibbons, 2003) introduce a number of characteristics that differentiate it from 'Mode 1'. These include:

- The context of knowledge production: Knowledge is always local, but is bounded by the context of application. In turn, the context of application includes an open environment that embraces a wide range of different science-production domains or disciplines (including both academic and non-academic environments, such as industry, corporate-environment, state, society). In contrast to 'Mode 1', this context of application comprises a pluralistic

environment where *"scientific problems arise, new methodologies are developed, outcomes are disseminated and uses are defined".* In 'Mode 2' the trust in absolute-knowledge experts is reduced and this happens because of the dynamic social negotiations that take place among stakeholders.

- Trans-disciplinarity: In 'Mode 2' knowledge derives from a variety of different scientific domains and therefore, becomes trans-disciplinary. This happens primarily because the complexity of the variety of the contextual problems requires a synergistic, collaborative contribution of different proficiencies that cannot be obtained from a single disciplinary domain. Therefore, knowledge is not constrained by the rules, criteria, or principles of a single discipline and thus, creativity stems from the capacity of the whole network to mobilise its stakeholders to conceptualise new theories, methodologies and practices which in turn will possibly create new areas of scientific practice.
- Diversity of the sites of knowledge production: While in 'Mode 1' the rule was disciplinary homogeneity and hierarchy in terms of one imperative foundation, in 'Mode 2' knowledge production is heterogeneous especially regarding the capacities of the stakeholders. Therefore, in 'Mode 2' we speak of a plural decentralised and distributed mode of networked communication and collaboration and thus, of a plural organisational variety.
- Reflexivity in knowledge: In 'Mode 2' knowledge is based on a perpetual evaluation and is no longer considered an objective investigation of the natural and social world. Moreover, the process of knowledge production is dialogic and is based on a discursive activity among actors, in terms of a variety of research subjects. This means that new knowledge is not metaphysically produced but is the result of the interaction of the research processes that take place within the problem-solving contexts.
- Quality control: If in 'Mode 1' the control of the quality of the results was strongly related to the judgement of peer reviewers, who were selected among a group of experts that previously produced high quality outcomes, in 'Mode 2' knowledge is not related to previously reliably identified peers because there is no longer a stable taxonomy of codified disciplines from which peers can be drawn. Also, reductionism is not a method for quality control, while no unchallengeable criteria can absolutely determine quality. The fact in 'Mode 2' is the multiplicity of definitions of quality.

Following the aforementioned analysis, the process of knowledge production in contemporary science and technology can only be understood as a network of diverse actions from various participants. In the next section we will focus on an approach that offers an ontological framework for understanding network processes in terms of knowledge production in scientific and technological contexts. In short, in Actant-Network theory Latour presents a 'performative' conception of the social, immanent to the activity of the agents.

5.2.4.1 Actant-Network Theory

Actant-network theory (or Actor-network theory or ANT) is a recent stream on theoretical development that derives from Symbolic Interactionism and the movement of Social Construction of Technology, a recent program in the history of sociology of science and technology (Callon, 1986a, 1986b)(Latour, 1988)(Law, 1987). The purpose of Actant-network theory is to outline the basic concepts for the development and operation of science and technology. Actor-network theory attempts to overcome the major pitfalls of both modernism (e.g., separation of nature and society) and postmodernism (e.g., language as an overarching structure), namely the structural understanding of reality, and thus, attempts to provide a theoretical framework for understanding the dichotomy between society and technology. Actor-network theory attempts to provide an all-the-way-down break with the past and especially with the foundational, modernist/methodical or postmodern/relativistic, approaches which were in search for the absolute language or the illusory *"ultimately determining instance"* (Jameson, 2005, p. 88). Therefore Actor-network theory criticises and re-evaluates the claim for the development of knowledge and reason in both modern and postmodern traditions. Hence, undermines the modernist implied faith in progress that is coupled with an explicit belief in the beneficial role of technology for social transformation but also the radically postmodern separation of the 'in-between' (e.g., the separation of language as a supreme metanarrative) and its declaration as central and autonomous.

Actor-network theory is to show that this separation is artificial. It does not attempt to elevate itself as a utopian ideology but rather, it organises a theoretical apparatus which - stems from the sociological philosophical tradition [and] - argues that both science and technology need to be considered in action rather than theory. It also supports that their effort to understand and design intervention for social change, must focus on the changing aspects of their *interaction* rather than the solidity of their *relationships* and the permanence of their material *structures* (Latour, 1988).

Therefore, Actor-network theory can be seen as an analytic tool for thinking about human/actor, social and technological development, all at once in a network of interactions. This network is does not advance itself to another metanarrative but it is seen as a heterogeneous network of dissimilar 'entities' that *"take their form as a result of their relations with other entities"* (Law & Hassard, 1999) and often include, among others, symbolic elements, biological entities, social arrangements, technological artefacts etc. All these are treated as inseparable while the main goal in such a network is to identify all these heterogeneous elements (problem of selection) and thus intervene by describing the interaction and providing enough evidence in making those elements working collaboratively. Therefore Actant-network theory is to be positioned in-between the epistemological hiatus of interpretivist/constructivist theories and studies of technological determinism (Bloomfield & Vurdubakis, 1997). This set of beliefs that emerges in from theoretical

ideas of Actor-network theory, diverge any posed centre on structures (actors, technology) or relations (society) towards the direction of a networked phenomenon of the relations of processes; namely that of 'interaction'. The idea of structures as process proposes a different kind of materiality – the one that Law calls 'relational materiality'- where any observed entity is defining its temporal structure because of its relation and interaction with other entities which occur on a 'flat' ontological ground. In this context of thinking there are no dualistic distinctions between human and non-human, material and non-material, etc. Hence, subjectivity, agency, society, technology and any other observed domain participate and are thought to have no a priori distinct, defined effects on their interactive associations. All should participate and at the same time mediate the existence of the interactive construction of the network that in turn assures their existence/making and participation. This is a dynamic development of parts, wholes, and their relationships, without the need for a metaphysical device or posed centre that externally defines their properties. This is similar to the autonomous creation of open-ended, self-organising systems that in terms of the autopoietic interactive paradigm, Maturana described as 'self-producing'. Therefore actors and actor-networks cannot embody stable characteristics but rather they can only reflect process of multiple trajectories that can potentially become either, stable as a dynamic equilibrium, or reflect unstable misaligned relationships. This process of *stabilisation* that thrives in any network is always related to the variety of alignments that the different actors will display within the network by negotiating their powers in the interactive process of *translation*.

Because of this inherent power of Actant-network theory, which derives from the flat ontology that uses as its descriptive model, it cannot be considered in terms of the interpretivist assumptions which marginalise the technological or other non-sociologically determined issues. This type of observational isolationism deprives the ontological power from Actant-network theory and this happens primarily because it excludes certain relationships that are 'shaping factors' in the network (Cordella & Shaikh, 2006). Actant-network theory does not exclude itself from the network of interactions and thus it can also be considered as a dissipative theoretical entity that can only define itself within the network that it describes. It therefore does not detach itself from the phenomenon that it explains and this is evident as the non-grand-narrative character of the theory. Its inherent power is located in its ability to expand its complexity by the fact that it is interactively enhanced by participating in the network.

In order to summarise the main concepts of Actant-network theory we provide the salient features related to our theoretical interests.

Actant

Actors or actants[109] are considered the participating entities that perform actions in the network (intentionally or not). There is not a stable definition for actants and therefore there is neither a typical factor for describing actant's physical or psychological characteristics nor a regulative assignment that exists behind their actions. In Latour's own terms, actants in their most general form can be thought as *"entities that do things"* and can be both human and non-human (Latour, 1992). In addition, actants can activate a network of diverse participants to do things. For instance a collaborative system can mobilise its users to perform actions they never imagined and thus become part of the network of the collaborative system. For this reason such an actant is considered a *black box*[110] primarily because its history and complexity are transparent to the network and only its stability as a functioning mechanism is important. These characteristics of the actant pose a crucial break with the conformist currents of social science and therefore construct a formal description of *hybrids* (or *quasi-objects*, following (Serres, 1974)) as participating agencies in the networks (Latour, 2006, pp. 51-55). Latour believes that the world contains nothing but such hybrids which for him are actants that are distant from the Aristotelian substances[111]. For Latour, hybrids are not *"privileged inner kernels encrusted with peripheral accidents and relations"* (Harman, 2009). A hybrid or a quasi-object is an actant which is seen as an 'evolving entity' in the network, formed during the testing of the stability of its organisation when it is compared with the organisation and influence of others (in the network). The ontology of the actant is not based on the materiality in terms of substance but on a 'process materiality' in terms of action: matter is process and thus unstable, action is also processual but actual (in terms of its existence). Therefore substance is not to be seen in the material base but on the transformational character of action (concreteness of change and differentiation). It is supported here that actants carry agency when they contribute to the semiosis of a situation, not an a priori agency pre-given by metaphysical means. This description of actants has many correlations (or prehensions in Whitehead's terms) with the descriptions of, among others, Maturana's autopoietic organisms, Foucault's

[109] In actant-network theory the word "actant" is often used instead of "actor", with the intention to dismiss any human connotations of the latter.

[110] Black boxes are considered the products of a process of simplification (the black boxing) where sub-processes in a network are treated as single elements.

[111] For Aristotle, all acting agencies are substances profoundly concrete in terms of materiality. This ontological assumption is compared to their capacity to exhibit habitual actions, but also to their relational character to other entities and therefore is assumed that are capable of enduring despite changes in these inessential features.

power/knowledge structures, Whitehead's systems, and Deleuze's bodies without organs[112].

Network

The term network according to Latour is defined as a *"group of unspecified relationships among entities"* and its role is to combine/relate material, human participants, organisations, inscriptions etc. The relationships that are developed in a network dynamically configure the actants by defining their characteristics. Therefore networks can be seen as assemblages of the integration of the connections of the material, the biological and the symbolic while Actant-network theory itself can be seen as a material semiotics theory. Networks (non-technological systems, assemblages, graphs) in general, are made up of actants that act (exchange, translate, transform, mediate, transduce, connect, circulate). Akrich and Latour describe this network as *"a chain of H(umans)and N(onhumans), each endowed with a new competence or delegating its competence to another"* (Akrich & Latour, 1992, p. 262). Actants and networks are therefore mutually constitutive and thus cannot be understood in isolation. Any attempt to speak of an actant apart from its relations to the network is only an attempt to define a metaphysical reality similar to materialism and the other theories of substance, or what Whitehead calls *"vacuous actuality"*.

Actant-networks are in a continuous state of instability, that is, a continual state of 'simultaneous becoming', including the possibility of termination of all its processes. This is the purely relational conception of the actant-network and therefore any attempt to describe their actual characteristics in a solitary style, must be ascribed to the need of the researcher/observer who artificially detaches him/herself from the network in order to analytically define the range of the study and thus to observe actant-network characteristics as 'fixed' - in observer's mind - relationships[113]. Actant-networks are therefore understood to exhibit their 'behaviour' in open-ended relationships that can only temporarily be seen as static for the purposes of analytic study.

The influence of an actant is always dependent on the dimensional properties of the networks that he/she/it is involved, in terms of its regulatory powers, while the dimensions of the network are defined in terms of the amount of actants that it can

[112] Nevertheless differences are still there. Deleuze for instance has a strong disbelief that concrete actual entities are primary in the world and thus supports as primary their 'virtuality' rather than their 'actuality'. Whitehead on the other hand supports philosophical naturalism as his metaphysics whether Latour's speaks of a science of relations with a type of secularism that does not attach to any kind of metaphysics (eternal objects, ideas etc) but tries to keep the interaction on a local level.

[113] This is the major pitfall of all foundational theories that ascribe meaning on a fixed centre.

align. On the other hand the size of an actant is not significant, primarily because all actants are considered equally, but the actual position of the actant in a network is what defines its networking capacity and therefore its powers and its influential means in the network. These influential means, of the position of the actant in a network, are closely related to the goals that can be achieved when an actant tries to rearrange the network around it. Therefore, networks are reorganised by the actants who, by pursuing 'intentional actions' (for an observer), attempt to bring forward a number of processes which include: selection of action, adaptation to the network, or action to unveil the built-in properties of a type-configuration or setting (e.g., equipment, device etc.). These built-in properties are called *prescriptions* and define the *affordances*[114] of a setting of a network, or in other words what the setting 'prescribes for' and what it 'permits'.

While the networks self-organise, and thus, build themselves, a number of collaborative capabilities are enabled and therefore, networks creatively expand. This is a process of '*punctualisation*' and refers to the surplus of the network capacity compared to the capacities of its constitute and parts. The reverse process of '*de-punctualisation*' is related to the eclipse of networked capabilities because of the other goals that actants might practice; in the case that actants are related to other networks.

Translation

Translation in Actant-network theory is a circular process of interpretation of the network, or the 'definition' that each actant construes for the other actants in the network (Callon, 1991). The term 'translation' has been adapted by the comparable concept which Michel Serres introduced (Serres, 1974). By the term translation, Callon and Latour understand *"… all the negotiations, intrigues, calculations, acts of persuasion and violence thanks to which an actor or force takes, or causes to be conferred to itself, authority to speak or act on behalf of another actor or force."* (Callon & Latour, 1981, p. 279).

As stated by (Callon, 1986b), the process of translation takes place in four *moments*; it starts with problematisation, is followed by interessement and enrolment, and concludes in mobilisation. Accordingly they refer to:

[114] The term was originally introduced by Gibson to denote the "action possibilities" offered by an object or environment to an individual subject (Gibson, 1986; Gibson in Shaw & Bransford, 1977).

- Problematisation concerns the definition of the problem and the selection of actants who relate themselves to the problem and intervene, and thus, become essential part of the network.
- Interessement consists in interrupting potentially competing relationships that have been developed among a set of actants in the network and attempts to construct a system of alliances that involves other primary actants. These actants are involved in the network as persuading mechanisms for other actants. According to (Law & Hassard, 1999) intersessement is related to the capacity of the actant-network relations to 'attract' an actant by interfering in its relation with another actant. If intersessement is completed successfully then the third moment takes place.
- Enrolment is the process where roles are ascribed to the actants. Enrolment is a coercive process primarily because certain sets of actants impose their power on others.
- Mobilisation is the process where primary actants influence other secondary actors to take action.

Therefore, it is clear that transformation of the network is the resulting process of translation. This actually construes the ontic principle of Actant-network theory where no transportation is possible without translation. This can be seen as correlate resulting assumption to the necessity of difference that makes a difference (Bateson, 1972). Latour's principle is a principle of irreduction which means that nothing is inherently either reducible or irreducible to anything else and therefore translation or difference are necessary processes for a network to exist (Harman, 2009, p. 116).

5.2.4.2 Summary

As we have mentioned earlier, Actant-network theory maintain as its basic idea that *agency* is a fundamental property that is not to be dismissed from both human and non-human entities in a network. Both sustain the capacity to influence the network and therefore exhibit relations of power in it (organise it). The main criticism of Actant-network theory points directly to this statement and poses the problematic of *intentionality,* which it supports that distinguishes living organisms from non-living ones (Rose & M. Jones, 2005). Evidently, Actant-network theory never attributed intentionality to non-living entities (Callon & Law, 1995), primarily because the conception of agency does not presuppose intentionality and secondly because agency, as defined in Actant-network theory, is neither a property of living organisms, nor of material objects. Latour has long argued for a redefinition of 'agency' away from a paradigm of independently acting agents (intentional agents) and towards a model in which all action occurs within systems or networks of human actors and their constructed artefacts, and technologies (tools, equipment, theories, ideas, methodologies etc.). Agency therefore is developed in terms of the processes that emerge in-between the interaction of actants whether are living and/or non-living entities.

To conclude we can identify that Actor-network theory's theoretical abundance stems from its repudiation against simplistic explanations of the structures of classical, modern and postmodern ontologies (e.g., natural, social, symbolic, discursive etc.). Therefore, it is evident that the considerations of Actant-network theory deviate the focus of analysis from the actor, technology or society, towards a more complex and less defined phenomenon that of the interaction. Hence, all these entities of the networks are not stable structures but processes that develop their temporal dynamic equilibrium in terms of interaction among themselves within the network of relations.

Moreover, Actant-network theory offers a radical alternative to the systemic approaches that rely on the separation of different levels of emergence for the constitution of hierarchical self-organising systems. In these cases of 'downward causation', as presented in {see §5.2.5}, the higher-level organisation defines the constraints on lower-level constituents, and from the interactions of the sum of the constituents at the lower-level the higher-level dynamics occur. The argument that is offered by Actant-network theory against this idea is pointing to the separation of these levels and the assumptions regarding their homogeneity. This deconstructs the assumption where 'all interactions that evolve and constitute a level of self-organisation have the same magnitude/scale'. Latour argues that, especially in terms of social interactions and interpretation of social systems, heterogeneity rather than homogeneity is the rule. Therefore Lemke supports that this level arrangement poses the problem of the isolation of interaction scales in different levels and thus makes impossible the integration of levels across different scales (Lemke, 2000). As a result, Lemke proposes that Actant-network theory seems more "natural", compared to downward causation, for systems significantly structured by the role of human semiosis and its material artefact (e.g., collaborative design).

This poses an important philosophical consequence that relates very well with other theoretical ideas that have been explained in this thesis and thus support the relational and processual character of the (de)constructive theoretical framework that is to be analysed in the following sections.

5.2.5 Causation and emergence in communication and collaboration

In many long-established research traditions, including those of communication and collaboration, causality is considered the belief that actual events occur in close relationship to one another. Thus, in its simplest sense, the primary cause of human communication and collaboration is to fulfil the needs of interpersonal interaction and consequently fulfil the need to make this process persistent. According to a number of the theoretical models we analysed in this thesis (including rationalist, systemic, constructivist, idealist, hermeneutist, etc) individuals communicate and collaborate in order to maintain personal, social and cultural relationships while the

basic mode of determination of the causal necessity for them is identified in processes of *interaction, self-maintenance, otherness, social equality (egalitarianism), consensus and democratisation etc*. But the interpretation of these processes are in many ways contradictory and often fall into logical fallacies: in terms of the nature of causality itself and its foundations where cause and effect are seen as factual relations, and at the same time self-opposing in terms of the correlationist argument (Hallward, 2008) of neutrality, where "*correlation does not imply causation*"[115]. In this section, we are to analyse the conceptions of causality that can be horizontally classified in the majority of the aforementioned examples.

Physicalism, in contemporary philosophy[116], is a type of causation which holds that '*any existing entity is no more extensive than its lower lever physical properties'* and thus everything conceivable is to be reduced to its physical properties; including consciousness itself. In many cases classical Physicalism is considered a type of materialism. Physicalism is often categorised as reductive and non-reductive [Figure 5-7]. Reductive Physicalism argues that mental properties are fully reducible to physical properties (thus are themselves accepted as fully intrinsic properties of the physical) while non-reductive Physicalism accepts that mental properties, along with other properties - that are observed upon the material -, establish an autonomous realm of existence that resists reduction to the physical/material.

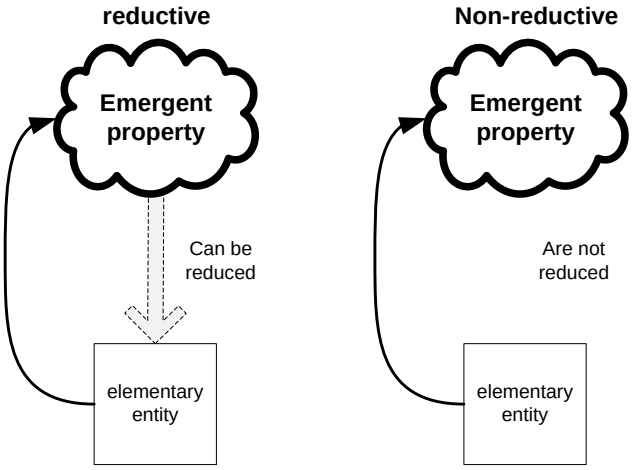

FIGURE 5-7 - REDUCTIVE AND NON-REDUCTIVE PHYSICALISM

[115] An idiom used in statistical science to emphasise that correlation itself is not the determining factor (necessity) - but rather a possibility of determination - between two variable entities and thus it cannot imply that the one is the cause for the other.

[116] Mainly associated with the zphilosophy of mind and in particular the relationship of mind and body (Kim, 2000b, 2005).

According to the concept of reductive Physicalism, every consistent pattern that is described in the supra-material levels such as language, organic function, living organism's consciousness and intentional behaviour, is considered superfluous, in terms of causality, primarily because everything occurs at the level of the material [Figure 5-8]; while the supra-material is irreducible. But obviously these conceptions are also rendered dubious in terms of their explanatory powers and particularly in explaining how it is that supra-material properties (e.g., mental properties) and processes are not reducible to physical properties and processes, but besides are still capable of displaying properties that become subject to their existence. In other words, the difficulty here is to explain this indeterminate unidirectional causality of reductionism. The combination of ontological Physicalism – the view that there are no concrete existents, or substances in the space time other than elementary entities (or material particles as in classical physics) and aggregates – and property dualism[117] develops to a contemporary, widely accepted, form of Physicalism where all entities are based upon elementary concrete, more complex, structures and assemblages. Kim aptly remarks that these can possibly demonstrate higher-level (emergent) properties that *are not reducible* to the ready-at-hand properties of the material (Kim, 2005). There arises the ontological gap between those existents - and their properties - that can be observed as physical/material and those that come into being at a higher-level, possibly through a non-material process.

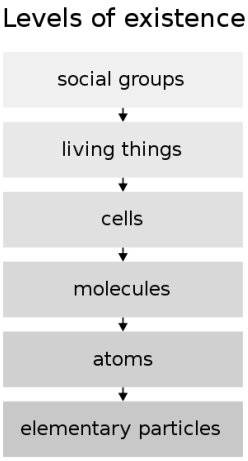

FIGURE 5-8 - LEVELS OF EXISTENCE

In order to fulfil this ontological gap the idea of *supervenience* was introduced by (D. Davidson, 2001). Supervenience is a non-reductive physicalist conception where non-

[117] This is based on Cartesian dualism that combines 'substance dualism' and 'property dualism'; the first entails the existence of the second.

material (biological, mental, social) events supervene on physical events and in addition these non-material events, is assumed, that cannot be reduced to physical events [Figure 5-9].

Hence from this perspective, Davidson still preserves that no non-material (mental) change is possible without the accompanying physical changes and thus insists in arguing that:

> *"Mental events such as perceivings, rememberings, decisions, and actions resist capture in the nomological net of physical theory."(D. Davidson, 1992)*

To further illuminate the notion of supervenience and its non-reductive functioning, Kim explains what it means that "*certain properties are supervenient on others*":

> *"(SP2) Mental properties supervene on physical properties in that if any x (in any possible world) and y (in any possible world) have the same physical properties (in their respective worlds), then x and y have the same mental properties (in those worlds)."(Kim, 2005, p. 242)*

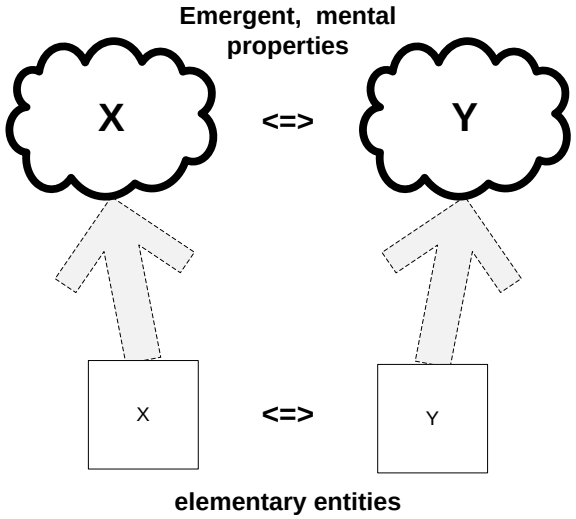

FIGURE 5-9 - SUPERVENIENCE

But this is not a lucid way to explain how supra-material causal potentials are derived from the 'possible' elementary functioning. Therefore the physicalist conception of supervenience falls short in explaining emergent (mental) events and thus, lets the ontological explanation it offers to be rendered obscure.

This ontological explanation is primarily suffering from its reliance on the Cartesian dualistic conception of the real and its ease in skipping the Kantian prohibition {see §5.2.6} without giving enough logical grounds towards this insistence. The physicalist

thinking of the world is imprisoned in the problematic dichotomy of mind and body (mind-body problem) and as a result is devoted in accepting a notion of causality that is bounded; and also a physical reality that is restricted by this causal closure. Apparently the recent developments in contemporary sciences inform us against the certainty of such dualisms and in addition provide enough evidence against the concretisation of the idea of a material world constituted by the ever reductive existence of elementary entities such as the fundamental particles, hypothesised by the ontological apparatus of Physicalism. In contemporary physics (post-particle based physics), what constitutes the causal fabric of the world we experience is not to be reduced on some short of substance metaphysics (material concrete entities) but rather is to be thought as an evental site of continuous development in a diverse and contingent universe. The transition from fundamental particle physics to the Quantum field theory (Brown & Harre, 1990) provide an inspiring new domain of research where the material is to be reconceptualised under a speculative realist (Meillassoux, 2008) the philosophical naturalistic (Whitehead, 1978) conception where elementary entities and their interactions are *processes* of 'dissipative structures' that result from the quantisation of interacting fields in a chaotic universe that is defined under the logic of hyper-Chaos; where everything is possible except contradiction that can be proved all the way down (Meillassoux, 2008). This theoretical shift reconfigures our understanding of the real and diverges our focus from the fundamentalist 'hardening' of the causal necessity of the material to a *contingent*[118] counterfactual / hypothetical anticipation of an emerging (comprehension of) reality. Emergence in its broader sense is the understanding of the physical stratified in different levels of organisation where every level can bring forth its own causal powers (Kim, 1992)(Bickhard & D. T. Campbell, 2000). Accordingly, this is a central notion for the analysis of self-organisation.

The most striking thing in Physicalism, as well as in correlationism {see §5.2.6}, - and in a way their main problem of logocentric thinking - is not the excess but the deficit of genuinely relational thought. The physicalist turn to Emergentism[119] is also bounded by the necessity to avow a physical base level were everything refers to. Emergentism then is the view that given a certain level of complexity in biological processes a new phenomenon emerges that of consciousness. In fact, there is no-entity that is not physical even though the supervenient relations acknowledge the

[118] Possible but not certain. The term here refers to the Latin 'contigere' meaning 'to touch, to befall'. Is something that finally happens although it is irreducible to the pre-registered possibilities. This contingent, puts an end to the egotism of the chaotic '*All, whole, everything*' and its regressive behaviour. Even it is improbable, is absolutely predictable.

[119] A branch/theory that is related to the philosophy of mind.

configurative character of the fundamental material particles. Kim's emergentist turn, apparently, shifts his understanding of ontological Physicalism and accepts that elementary entities are not fixed. Therefore he identifies that such entities exist, but also exhibit *configurations* that in turn generate the emergent supra-material causal powers[120]. Symptomatically, he accepts macro-properties as emergent, and in order to avoid the drainage of all higher-level causality, he states that:

> *"It may be that the causal powers of a micro-based property may be determined by its microstructural details but we may not be able to explain—in fact there may be no explanation of—why a property so microconstituted should have just these causal powers. This would be another way in which a macro-property may be emergent. Further the fact that we can micro-structurally explain why a micro-based property has a certain set of causal powers does not mean that these causal powers are identical with the causal powers of its micro-constituents. Micro-reductively explainable causal powers may be new causal powers, net additions to the causal structure of the world. None of this is in conflict with the basic commitments of physicalism. Physicalism need not be, and should not be, identified with micro-physicalism." (Kim, 2000b, p. 117)*

Therefore, Kim, although the stays faithful to Physicalism (or at last a variant Physicalism), he also accepts that there is a possibility that macro-properties may display emergent properties too; e.g., consciousness that emerges out of biological phenomena. Characteristically in his recent writings he states that:

> *"All concrete particulars in this world are physical, but certain complex structures and **configurations** of physical particles can, and sometimes do, exhibit properties that are not reducible to "lower-level" physical properties." (Kim, 2005, p. 212)*

But this mixture of Physicalism and Emergentism is not without problems. Even thought Kim managed to 'transgress' the traditional Physicalist rules - and in favour of evolving it to a purely genuine causation theory accepts macro-based emergent

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[120] According to (Shrader, 2005, p. 17), *"if (but not necessarily only if) an instance of a property Q stands in - or is involved in an event that stands in - a causal relation to some other property instance or event, that Q possesses, or contributes, a causal power."* But after a few pages Shrader argues that this is a difficult thesis to testify to. Characteristically he sets the question *"But which is it?"* and then he argues that *"This is a difficult question to answer, for it is safe to say that there is no agreement in the literature to which entities causal powers should be attributed. One can find in the literature references to properties possessing causal powers as well as substances possessing causal powers—even to events possessing causal powers. Usually, if it is said that a substance or particular possesses a causal power, it is because that power is contributed to it by a property."*

properties - his theory nevertheless remains imprisoned to the physicalist fallacies of fundamental particles and their basic level properties and thus is constrained by an ontological conception of emergence (Shrader, 2005). More specifically, like the British Emergentists (McLaughlin, 1992), Kim insists that those emergent properties of the higher-levels are not genuinely emergent, but rather, such configurations (of the higher-level) would never produce any authentic and novel emergent causal powers (as we will see later on, he formulates a notion of downward causation).

Hence, by avoiding the causal drain where, *"causal powers would drain away into a bottomless pit and there wouldn't be any causation anywhere!",* Kim submits to the *epiphenomenality* of the apparent regularities that are distinguished in terms of temporal differentiation. Therefore the way that Kim tries to prevent this difficulty, retrogresses him to 'a metaphysics of causal epiphenomenality' where he provides no means to carry away this problem. Here we must note that while Kim symptomatically solves the problem of causality in the physical world he also introduces a new difficulty, namely a closure at the micro-physical (Hansen, 2000). This is supported in a number of incompatible arguments as outlined in the following theses:

1. the non-reductive character of Physicalism (or property-dualism),
2. the causal efficacy of the mental (mental-to-physical causation),
3. the principle of physical causal closure,
4. the unacceptability of (systematic) over-determination (epiphenomenality).

Thus by accepting the supervenience argument where non-reductive Physicalism and the causal efficacy of the mental are advanced to necessities, we are lifted to the dilemma of rejecting either the principle of physical closure or the unacceptability of over-determination. The intricacy that arises here is related to this constraining ambivalent choice of Physicalism; where if we are to be non-contradictory we have to decide on either physical closure or over-determination.

Kim therefore describes causation in general as a relation between events, and defines *downward causation* as *"a higher-level property which [...] causes the instantiation of a lower-level property"* (Kim, 2000a, p. 309), but he admits that this expression is insufficient since *"… causation is not a relationship between properties but between instantiations of properties"* (Kim, 2000a, p. 390, note 6). The notion of downward causation is therefore closely related to anti-reductionism regarding the properties of the mental. If, according to Physicalist reductionism, mental events are just physical events, the assertion that they exert their influence from higher-levels to the physical level seems metaphysically imposed [Figure 5-10].

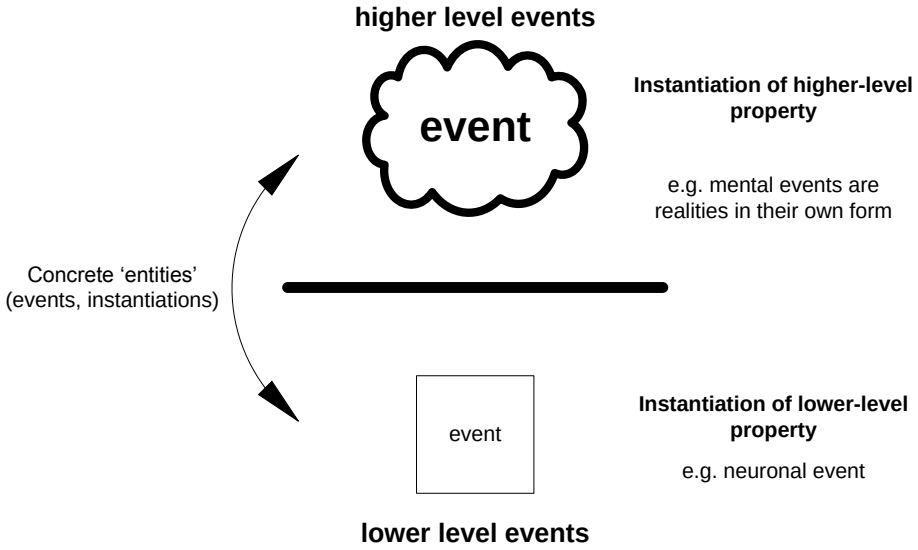

FIGURE 5-10 – HIGHER-LEVEL AND LOWER-LEVEL IN DOWNWARD CAUSATION

As Campbell et al. successfully recognise *"causal epiphenomenality is not just a semantic problem, to be defined away by 'better' definitions of supervenience".* Rather they propose that is a dead end for Physicalism. As we mentioned earlier, this occurs first and foremost because the theoretical conception that is offered by Physicalism is condemned to oscillate between causal epiphenomenality and the bottomless pit of the causal drain (R. Campbell & Bickhard, 2004).

As a result, Kim relates, this reverse type of causation, to a process that duplicates/instantiates lower-level events to higher-level and therefore *"represents the view that the cause-effect relationship in downward causation is a relationship between events at two different levels of organization"* (Hulswit, 2005, p. 269). But still, this for Kim does not solve the problematic nature of downward causation, and its credence that an inconsistent whole causally affects its constituent parts on which its very existence and nature depend upon (Kim, 2000a, p. 314). To give an answer to this problematic nature of the relationship between wholes and parts, Kim, proposes the distinction between *diachronic* and *synchronic* downward causation that is based on the distinction of their temporal appearance [Figure 5-11].

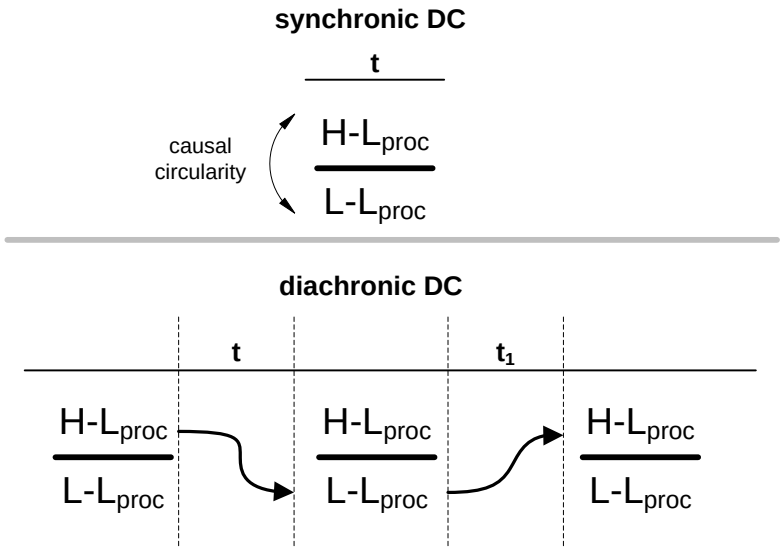

FIGURE 5-11 - SYNCHRONIC AND DIACHRONIC DOWNWARD CAUSATION

Consequently, diachronic downward causation is defined - by following Hume's factor of priority in time of cause to effect - as the *"causation from properties of a whole to properties of its constituent parts at a later time,"* whereas synchronic downward causation is *"causation from properties of a whole to properties of its constituent parts at the same time"*. But Kim rejects that synchronic downward causation is to ever occur as a mental activity at a higher-level primarily because in order to be comprehended – produce meaning to an agency – *"it must be understood as a causal influence of a mental event on a neurophysiological event at a later time"* (Kim, 2000a, pp. 317-318).

Apparently because of his background Kim cannot contemplate downward causal events (instantiations) as contingent evental sites (transitive situations), or as Badiou similarly calls the emerging decisional events about something that is yet undecidable within a given situation (Badiou, 2007) or even further as Derrida outlines in his notion of the *'différance'* in order to predict the non-simplex continuity of causal events, but he accepts that downward causes are stable events which are composed as *efficient causes;* in the rigid/classical sense of the word[121]. This means that the only

[121] Aristotle described efficient causes (αιτία) as 'something that is responsible for the creation of an effect on something else' in the sense that an efficient cause is a thing that by its activity brings about an effect in another thing. This is the most common conception of causation that we meet today in materialistic sciences that mainly deal with substance-performing-change causality (*substance-being-responsible-for-change* and *substance-as-the-primary-source-for-change*). It is a matter of dispute however, that Aristotle supported the necessity of the transference of the idealistic form (efficient) to the material form (effect) and thus the theological, metaphysically logocentric appropriation that is generally accepted by many

type of causality that is possible to resemble the world, is efficient causality between concrete entities (events) and this mainly because it is the only type of causality - according to Physicalism - that implies transitivity[122] of the nomological sufficiency.

As we will try to show in the following paragraphs, this is the main reason Kim distinguishes downward causation as formal and/or efficient causation and thus tries by undermining its principle assumptions to redevelop a rigid notion of 'causality'. In the next section we will try to further analyse the basic distinctions that appear in literature regarding the concept of downward causation and successively we will attempt to outline the main problems that arise by following them.

5.2.5.1 Downward Causation and the paradox of the principle of irreversibility

As an alternative to the physicalist and the emergentist understanding of causation and emergence, a number of researchers (Queiroz & El-Hani, 2006a, 2006b) (Emmeche, Køppe, & Stjernfelt, 2000) propose that: where there are observed emergent properties and powers, it seems plausible that downward causation is a good alternative. Then they try to creatively deconstruct the basic doctrines of the classical Reductionism and Emergentism which, in short, are:

Ontological Physicalism: everything that exists and is observable in space-time are elementary particles recognised in physics and their aggregates [Figure 5-12],

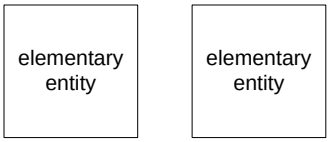

FIGURE 5-12 - ELEMENTARY ENTITIES

Property Emergence: these aggregates that are composed of material particles and exist in space-time, is possible to arrive at levels of structural complexity that are suitable for the emergence of novel properties. These novel properties characterise the organised wholes (structured systems) [Figure 5-13],

contemporary scientific communities that base their systems of belief on the rationalist thinking (often deriving from the sublime - e.g. god is the genuine cause) (Hulswit, 2004).

[122] Transitivity means that: If a=b and b=c, then a=c.

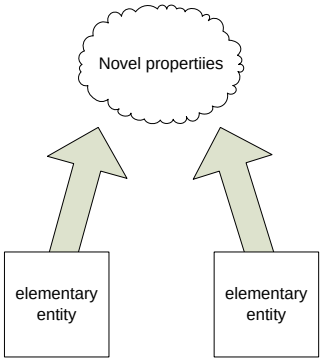

FIGURE 5-13 - PROPERTY EMERGENCE

Irreducibility of the Emergents: these novel emergent properties of the organised whole are irreducible to and unpredictable from the lower-level phenomena from which they emerge [Figure 5-14],

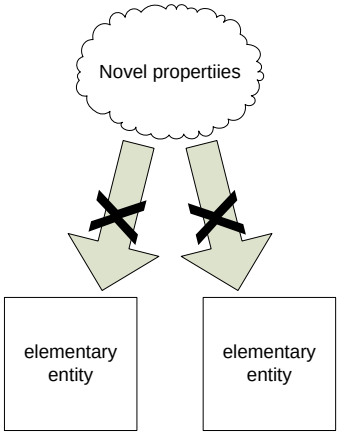

FIGURE 5-14 - IRREDUCIBILITY OF THE EMERGENTS

and thus introduce a fourth doctrine that of downward causation where higher-level entities may have a causal effect of their lower-level constituents.

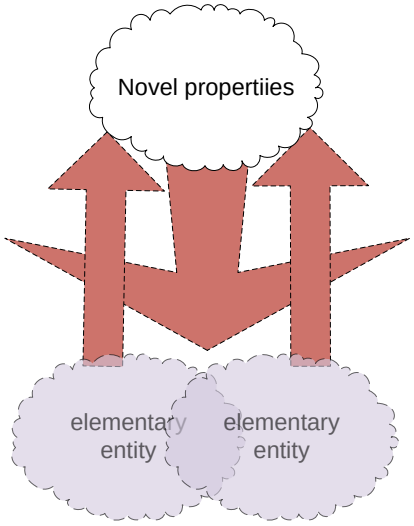

FIGURE 5-15 - NOVEL PROPERTIES, ELEMENTARY ENTITIES AND DOWNWARD CAUSATION

Despite the fact that it was firstly put forward by Lloyd Morgan in 1922-3 (C. L. Morgan, 1922), the original concept of *downward causation* and the one that forms most of the contemporary views (F. Heylighen, 1995) of the notion was given by (D. T. Campbell, 1974) as a converse to the principle of reductionism. According to this description *"the behaviour of the parts (down) is determined by the behaviour of the whole (up), so determination moves downward instead of upward"* and is never complete. D.T. Campbell et al. considered causes of 'downward behaviour' to be *general principles* and therefore they proposed a systemic perspective that suggests a strong disavowal of the marginal views of reductionism as well as radical holism. As we mentioned earlier, according to this idea *"the whole is to some degree constrained by the parts (upward causation), but at the same time the parts are to some degree constrained by the whole (downward causation)"* (F. Heylighen, 1995). A number of interesting examples of this bidirectional, non-partisan, systemic conception of causality are given by Heylighen for the material, the organismic and the cultural [Figure 5-15].

For R. Campbell et al., there are no material (elementary) particles or micro-physical entities - as described in Physicalism - that we will discover if we are to perform an exhaustive decomposition (Kim, 2000b, p. 15), but only fragmented configurational *entities*. In so doing they suggest that:

> *"Reductionist physicalism is false precisely because there are no elementary physical particles that can serve, in the required sense, as 'emergence bases'. Since everything is an organization of quantum field processes, more complex organizations of processes can yield emergent properties and powers, but it is the higher-level organization itself that is doing the work, not whatever might be its 'constituents'"(R. Campbell & Bickhard, 2004, pp. 28-29).*

Accordingly, these lower-level *entities* exhibit causal properties that are described as *processes or configurations*, while on the other hand the higher-level *entities* are general principles that can be credited as laws or law-like principles that function as 'constraining mechanisms' or cybernetic systems (controlling systems) upon the lower-level processes. But this conception of 'downward cause' can easily give the wrong impression if it is conceived in the sense that these higher-level *general principles* are efficient causes of concrete events; in the sense that 'causes' are turned into 'stable' processes or 'effects'. D. T. Campbell et al. arguably state that this happens primarily because the expression of 'downward causation' *"… is 'awkward' and excusable only because of the shambles that philosophical analysis has revealed on our common sense meanings of 'cause'"* (D. T. Campbell, 1974, p. 180). This operates conversely to the conception of Kim who, as we have already mentioned, believes that these general principles that emerge at the higher-levels are also concrete self-contained (symbolic) entities - he names them after the term 'events' - and are hardly related to the lower-level events; only, perhaps, through the processes of instantiation. Hence, for Kim who identifies these events with instantiations of the properties (downward causation) of the higher-level, properties of the lower-levels are also of the same type (instantiated) and therefore causation is only to be seen as the result of the interaction of these instantiations rather than between the properties. Thus, he supports that cause and effect correlation, in processes where downward causation is immanent, is a relationship between events rather than substances at separate levels of organisation (Kim, 2000a).

Given the above analysis, it is obvious that the conception of 'cause' as efficient causation is rendered obsolete in terms metaphysical attachment to a 'necessity of relation'. The idea that downward causation is a kind of *formal causation* is maintained by many researchers[123] that try to escape from the structuralistic implications that efficient causation transfers to the exegesis of unidirectional causation models. Without flinching from the implications of the dismissal of efficient causation, supporters of the formal causation, as an important issue in downward causation, argue that self-organising behaviour concerns the spontaneous emergence of patterns of organisation or forms (Emmeche et al., 2000). This type of downward causation is closely related to the concept of formal causation and is used to elucidate the transference and determination of the notion of information in systems that are observed to exhibit some short of semiotic/sign behaviour at the

[123] This is a remarkable shift of the mid to late 20th century from the long established scientific beliefs of modernity/Enlightenment that supported efficient causes as the ultimate exegetic device. This shift accepts the (assumed: detached from substance) Aristotelian formal logic as a valid concept for the analysis of emergent phenomena – assumed because this is opposed to Aristotle's original terminology of 'ειδική αιτιότητα'.

higher-level. This idea of downward causation as formal causation is similar to the concept of D.T. Campbell that we outlined earlier, which necessitated that "*all processes at the lower-level of a hierarchy are restrained by and act in conformity to the laws of the higher-levels"*(D. T. Campbell, 1974, p. 80). Thus the supporters of formal causation consider formal causes as higher forms that spontaneously (have no causal relation to one another) appear at the supra-material levels and act as constraining mechanisms, or law-like entities or general principles on lower-level entities[124].

The problems with downward causation, and more generally with the concepts of self-organisation and emergence, are located at the violation of the principle of irreversibility that is inherent in the classical conception of the notion of causation. As Hulswit rightly points out *"By saying that B is the cause of A, we mean that among other things that B explains or conditions or causes A and that A does not explain or condition or cause B […] Any theory of downward causation must come to grips with this paradox."* (Hulswit, 2005, p. 265). Therefore he asks two, in his view, fundamental questions about the nature of downward causation:

- Given that 'to cause' appears always to involve something that causes and something that is caused, what sorts of things are said to be, respectively, causing and caused within the context of downward causation?
- What is the meaning of 'causing' in downward causation?[125]

This is the main paradox or metaphysical locus in downward causation that many researchers try to answer with number of different approaches (Emmeche et al., 2000)(Queiroz & El-Hani, 2006a, 2006b)(Hulswit, 2002, 2006)(Brassier, 2007)(Meillassoux, 2008).

5.2.5.2 (Against) The paradoxes of downward causation

In their analysis (Emmeche et al., 2000) propose a complex theoretical, categorical scheme for understanding downward causation, which involves three types of causation. They call these: *strong*, *medium* and *weak downward causation*.

Strong downward causation is conceptualised as efficient causation and distinguishes between high-level and low-level phenomena, where the first exercises efficient

[124] In some sense this analysis of causation in the higher level have an interesting resemblance to the notion of formal causation that C.S. Peirce first introduced in his theory of signs. Peirce's pragmatist theory of information is inextricably attached to this semeiotic theory and is particularly interesting for the analysis of information processing and its emergence in contexts of communicative and collaborative processes. Although Peirce does not offer a complete theory of information in his writings, many researchers incorporate his ideas to the newly emerging area information theory and informatics (Hulswit, 2002)(Queiroz & El-Hani, 2006b).

[125] Obviously the second requires the first to be answered.

causal influence on the substances of the lower-levels. Therefore strong causation is seen as trapped to a physicalist substance dualism. In this case, meaning at the ontological level of downward causation is related to the concept of ***'bringing about'*** that is to be thought as an alternative word for 'causing'.

Medium downward causation is conceived as a phenomenon, where a higher-level emergent property/entity cannot be reduced to the sum of the constituting entities. Therefore, in medium downward causation the higher-level is self-producing and spontaneous. In addition, the higher-level emergent phenomena are privileged in terms of their cybernetic character, mainly because they apply 'constraining conditions' for the emergent activities of the lower-levels. This means that medium downward causation is bidirectional and according to this property, higher-level entities, which act as constrains, exhibit coercive powers and thus limit "the activity on the lower focal level". Simultaneously, this relationship also constrains "which higher-level phenomenon will result from a given lower-level state" and likewise, "the same lower-level constituents may correspond to a series of different higher-level phenomena" (Emmeche et al., 2000, pp. 16-26). However, Emmenche et al. make several different assumptions regarding the 'constraining' character. These are either 'organisational principles' or 'low-like regularities', but also concrete events of downward causation. In conclusion, the lower and higher-level entities present part-whole relations, where higher-level wholes exhibit 'teleological causation' on the parts. This type of teleological causation is inherent in the network of relations of higher and lower-level entities and is based on formal, efficient, as well as material causal relationships, although it remains ambiguous whether this teleological character exhibit efficient causation. In this case, meaning at the ontological level of downward causation is related to the concept of ***'determining'***, which involves necessitation in the associating process of causation.

Finally**, weak downward causation** is completely detached from any substance metaphysics and therefore, only displays organisational properties rather than material ones. In this sense, higher-level entities are not actual substantial phenomena in their own right, but rather '*potentialities'* or '*forms' or 'general types'* that resemble the ways that lower-level entities are organised. Briefly, the whole phenomenon is not to be reduced to the sum of the parts, but rather to a pattern of morphological associations between the parts, whereas the relationship between higher and lower-level entities is a relationship between *types* (general principles) and *tokens* (individual existents: events or substances) (Emmeche et al., 2000, p. 29). That is to say, form and matter exist at the same phenomenological basis and therefore, are not comparable to the dualistic conception of substance and process. In this case, meaning at the ontological level of downward causation is related to the concept of ***'strict relationship or explanation'***, which involves a demand for relationship as an obligatory necessitation that is inherent in the associating process

of causation. Here, downward causation is neither a constraining condition to the lower-level, nor lower-levels resemble several higher level phenomena. At this level of meaning production, weak downward causation enters the epistemological sphere of explanation which involves strict relationship between the constituents of the higher-level. This necessary explanation, immanent in weak downward causation, *is* and *remains* weak, and therefore metaphysical, as long as there is not a verification that can support it. This verification is only circularly produced[126] by reference to the phenomena that it explains and therefore it cannot be adequately be empirically reconstructed but rather it constantly remain in a perpetual epistemological regression. This type of explanation resembles many of the features of radical postmodern thinking primarily because it remains merely speculative. Unless an idealistic evidence temporally produce an unstable meaning that is accepted as such, explanation in weak downward causation regresses infinitely. On the other hand such explanatory principled ideas provide the epistemological ground upon which hypotheses of any kind (including scientific) can be produced. These ideas an not useless but remain preys to the circularity of the process. As Hulswit pertinently argues in an example for the verification of the law of inertia: *" … the law of inertia … explains a lot of things. But it had never been empirically verified except by occurrence of the phenomena it explains, nor it can be verified because such verification could only be made on the basis of the correctness of the interpretation of facts, which is precisely what needs to be explained."*(Hulswit, 2005, p. 281)

Therefore, it is clear that both medium and weak downward causation, in this sense, are distinct to strong downward causation. But, what are the differences between them? In summary, we submit that while in medium downward causation everything is considered a process, - in contradistinction to strong downward causation -, and therefore a types or tokens, these abstract types in weak downward causation exhibit the behaviour of higher-level forms or, in correlation to systems theory, to 'attractors' of *stable behaviour*. Moreover, the effect of downward causation is not understood in terms of constraining conditions and this because the same lower-level phenomenon does not correspond to several higher-level phenomena (Emmeche, Køppe, & Stjernfelt, 1997, 2000), while the process of constraining is itself, as a token, not an emergent property of the process. Hence, in medium downward causation we have variably mutating attractors or forms that are responsible for the downward causal influence and are emerging properties of the process, whereas in weak downward causation the constraining processes are changeless non-contingent forms. In particular, in weak downward causation, the higher-level constraining

[126] It is purely reflexive, presupposing a conclusion in the premises of a syllogism (circular reasoning)

emergent form is unique, and therefore, lower-level tokens are related to only one of them that, as we mentioned above, tries to retain its organisation.

This is an interesting categorisation that is not without problems. Specifically, Emmenche et al. tend to ignore that substances, even in the case of efficient causation, are not necessarily material forms (as in strong causation) can be possibly instances or events. A similar vague observation applies in the case of the distinction of lower-level entities both in medium and weal downward causation as processes or interactions (Emmeche et al., 2000, pp. 26, 32). This uncertain character of downward causation, as described in its medium and the weak expressions, does not disavow the possibility of supervenient prohibition, as in Kim, where the supervenient base properties of entities of lower-levels are indiscernible in supervenient properties of higher-level.

This a-causal, pure, eruption of novelty *ex nihilo*, which is also evident in many realist conceptions of causation, rejects the possibility of any external relations that an observed system might exhibit with its horizon. According to this conception, the notion of 'perturbation' as described in the autopoietic theory of Maturana and Varela (Maturana & Varela, 1992) is just a collateral event that does not play an important role for the emergent properties of an open ended system. Therefore, the idea of a supervenient a-causal phenomenological ground ignores the observed self-organising behaviour that many open-ended self-maintaining systems require in order to sustain the continuous relational linking that seems to provide the 'means' for their being. Hulswit aptly points out: *"Living, for instance, is not a supervenient property for it cannot exist without a continuous flow of constituents. Emergent systems therefore cannot be supervenient in a standard sense"* (Hulswit, 2005, p. 277). We argue that the same applies in every case where emergent phenomena are observed, including areas of psychological and sociological interest.

Therefore, it is obvious that in order to abandon the classical Aristotelian substance-ontology, as well as the strong/medium/weak causal influence of a supposed stratified universe composed of concrete entities/forms, and the consequent problems that these pose to our understanding of emergence, we must reconsider the possibility of a new categorical system of understanding and redefining ontology altogether. This categorical system necessitates the following:

- Redefinition of the notion(s) of causation and downward causation,
- (De)construction of metaphysics of causation:
- Abandonment of mechanistic substance ontology (substance metaphysics),
- Disambiguation of the relational character of the network of relations (process metaphysics) that is immanent in downward causation.

- To tackle this problematic nature of causation (in emergence and downward causation) many researchers provided a series of strategies (Queiroz & El-Hani, 2006b)(Hulswit, 2006).

5.2.5.3 (De)constructing causation in downward causation

On this basis, causation in downward causation can be seen as 'causing' in the strict modernist connotation, '*determining'* in the sense of necessitating that it could not be otherwise, or *'explaining'* in the sense that there is a referential relation although explanation remains a weak evidential factor. Admittedly, in the larger part of contemporary scientific writings, the notion of causation in downward causation refers mainly to *determination* or *explanation* rather than the classical modernist 'cause-effect' relationship (causal influence in the sense of '*bringing about*') between the higher and the lower levels. As we have indicated previously, most authors are disposed to an understanding of causation (in downward causation) in terms of formal causes and therefore, the concept is used to explain how certain processes happen but not necessarily that those processes occur. This is a vague description as it correlates development with the necessitation of existence and admittedly the concept of downward formal causation neither entails causation, nor explanation, but rather determination, as in Emmenche et al. medium downward causation.

In a generous response to Hulswit's argument (Hulswit, 2005, pp. 282-284) that points out exactly the same issue, Queiroz et al. write that Hulswit correctly points out that the meanings that are ascribed to downward causation's causal influence are not in direct relation to the intuitive use of the notion 'to cause' in the sense of bringing about but 'causing is mainly to be understood as structuring, governing, organising, restraining or bounding. They claim that this is due to the lack of capacity of the modern science (especially physics) to include the different modes of causality Aristotle proposed in his philosophy[127] and therefore they propose that we should move from downward causation to downward (formal) determination. But as they state, downward determination also requires a formalisation of the distinctions of the variety of notions, categories and connections between them (e.g., determination, law, cause). Hence, they attempt to define the notion of determination in terms of a semiotic Peircean framework (Queiroz & El-Hani, 2006b).

In our view 'causation' is a vague term that cannot be adequately explained in terms of a mechanistic understanding of the notion of causality. Such a conception leads to a teleological subordination of all (nature). Causation is not 'to cause' an effect but to 'participate' in the process of the organisation of the nexus that emerges between

[127] Arguably, Aristotle described the notion of "cause" not only as an antecedent event sufficient to produce an effect or the goal of a given action, but the basis or ground of something (Lear, 1988; Queiroz & El-Hani, 2006b; Ross, 2004).

'phenomenal causes and effects', while also synchronically stimulate them to (re)produce itself. Any causal necessity is metaphysical, there is no inaugurating cause (αίτιον) and there is no end (τέλος). Causation is to be thought as an influential active difference that is only to potentially stimulate difference. Causation, in the Derridean sense, is a surplus and at the same time the trace of an evolving network of relations.

An (in)dividual that participates within a (de)constructive process, is to redefine causation in downward causation, is to work within the terms of the system of causality. Its purpose is to penetrate through/in it and therefore, to try to reconstruct it in a new and creative way. If we take causation as a philosophical thesis, then to analyse this very philosophy is to *"work through the structured genealogy of its concepts in the most scrupulous and immanent fashion, but at the same time to determine, from a certain external perspective that it cannot name or describe, what this history may have concealed or excluded, constituting itself a history through this repression in which it has a stake"* (Derrida, 1982, pp. 15-16). (De)construction goes one step further where it accepts that to (de)construct is to influence change/differentiate from a position that emerges from within a network of relational processes. There is no external Archimedean point of view, rather, its observational locus is emerging from within and is always immanent in a network of relations with the observed phenomenon.

To (de)construct a discourse, such as causation, is to demonstrate the ways it destabilises the very position it affirms as valid. *(De)construction is a process* that tries to identify the states where causation itself undermines the hierarchical semantically antagonistic concepts on which it relies. (De)construction's aim is to ascertain the contradictory arguments that emerge within the limits of a given context; often by challenging (quasi-external observation) the assumptions made in the production of the boundaries of the context. To provide such a device, (de)construction tries to identify the rhetorical operations that produce the supposed ground of the argument, the key concept or premise that any focal concept is based upon, and therefore, reflexively anticipate a (de)construction of its very own explanatory powers.

Therefore, (de)construction is for the redefinition of the metaphysics of causation and, as we mentioned earlier, its first step is to consent with the evidence that downward causation theorists provide for the rejection of mechanistic substance ontology (substance metaphysics). What remains unanswered is the disambiguation of the relational/interactive character of the network of relations (process metaphysics) that is immanent in downward causation, or to put it differently the logocentric acceptance of a process that is/provides causation. In our view a

(de)constructive philosophical understanding of reality is to provide an ontological framework that does not rely on any type of metaphysical questions/assumptions[128] and in particular on the correlationist argument where process reality is to be a correlate product of the Kantian prohibition {see §5.2.6} of the linking between thinking and being that potentially is to provide real answers.

The (de)constructive philosophy is not only to be seen as a radical critique of substance metaphysics and process metaphysics. Its role is to make clear that the correlative character of process metaphysics and the possibility of the achievement of absolute knowledge through it, is just another contingent fact rather than a necessity. Consequently (de)construction is a creative process that has the dual capacity: to deconstruct or destruct - in the classical Heideggerian sense of *destruction* - but at the same time it is responsible to provide answers by mean of a framework of decisional or determining character. To achieve this level of purely relational thought and in order to be able to apply it to a purposefully communicative context (such as the interaction within social (con)texts) we incorporate a pluralistic and systemic theoretical account that includes in its analysis the individual, the socio-symbolic and the inaccessible, contingent real. The structure of the account is based on a semiotic conception of (con)textual interaction.

5.2.6 Correlationism and Speculative Realism

In this section we consider the possibility of returning to a speculative realist conception of the world and thus we explore the problems and possibilities that such an attempt might provide.

If we try to return to an anti-phenomenological understanding of the world then the main obstacle that we encounter, especially in the predominant orientation of thought in contemporary philosophy, is that of *correlationism*. As formulated by Meillassoux , correlationism is the idea according to which *"we only ever have access to the correlation between thinking and being, and never to either term considered apart from the other"*(Meillassoux, 2008). Along these lines Meillassoux labels the contemporary philosophy after Kant as a tolerant one, with the assumption of the immanent correlation of thought-being in any consideration of reality and therefore the acknowledgement that *"anything that is totally a-subjective cannot be"*. In other words the correlationist approach entails in demonstrating that an entity can only be thought *as it is given*, and it can only be thought as *it is given for a subject*. By emphasising to '*givenness*' for a subject, correlationism hence establishes the belief that we can never have access in what the entity is *in-itself* (Kantian noumenon,

[128] Here we move further away from the radical postmodernists who assume that deconstructive process itself can put into question the very possibility of metaphysics per se. Here we talk about (de)construction metaphysical properties, assumptions and questions.

thing-in-itself), but only what it *is* in relation *to-us and for-us* (Kantian phenomenon). In short, any truth argument one might articulate is not an *independently/objectively existing truth,* as it would be regardless of whether or not we as subjective observers exist, but only a localised *truth for-us*.

In describing correlationism, the speculative realists, state that:

> *"Correlationism rests on an argument as simple as it is powerful, and which can be formulated in the following way: No X without givenness of X, and no theory about X without a positing of X. If you speak about something, you speak about something that is given to you, and posited by you. Consequently, the sentence 'X is', means: 'X is the correlate of thinking' in a Cartesian sense. That is: X is the correlate of an affection, or a perception or a conception, or of any given subjective act. To be is to be a correlate, a term of a correlation." (Brassier, Grant, Harman, & Meillassoux, 2007)*

Following the aforementioned description for the correlationist thinking, we see that *no entity can exist independently of thought since to be is to be correlat*e; correlate either to *consciousness* as in phenomenology or *language* as in various trends of continental and analytic philosophy. What correlationists ask is what a legitimate correlation would be, or, in other words, which correlation is the one that will provide *givenness* of reality to the observing subject. For Kant, this indisputable correlation in the connection between transcendental subjectivity and the phenomenal matter of intuition are deriving from the definite description imposed by the observing subject's intelligibility. Following Kant the phenomenologists locate the correlation in the sense-bestowing activity of transcendental subjectivity in lived experience. To mention a few others, the hermeneutists argue that the correlative structures are to be found in historically informed linguistic consciousness. Deconstructionists urge against making definite judgments about (con)texts while favour strategies of deferral and equivocation that eventually suspend interpretative closure. Wittgenstein and his followers identify the correlation in language games constituting the world. Second-order cyberneticians and new-age systemics favour the relation of observer (with)in the observing system while remain agnostic about the truth-values of these first-order cybernetic discourses. Habermas sees a communicative type of correlationism in the universals of communicative action while Foucault's correlationist tendency is to be found in his dynamics of power and discourse. The major agreement among all these standpoints is the identification of an *ontic separation between subject and object* and thus the affirmation of a *causal relationship through correlationism*, a relationship between being and thinking. All these philosophies (including modern and postmodern traditions) that follow the Kantian prohibition (Kant's foreclosure of absolute reality), postulate a gesture of fundamental mediation between the

observing subject and the entity of thought, and thus advance the clarity and integrity of this linking association as the only justifiable means of accessing reality.

There exists a general hermeneutic "con-textualsation" of the real, where all kinds of correlationists do not 'speak directly' of the ontic by practicing a first order actionalistic ontological observation - to do so would mean to fall into naive realism - but exhaust their analysis by complicating the ontic with second-order observations of the observed (thoughts). Thus, rather than, according to speculative realist, engage with the entity per se, correlationist theoretical apparatus is induced into interminable meditations on how it is impossible to articulate it and often concludes to the impossibility of reaching/creating the *may-being* of a contingent real that speculative realists envision.

But what, in this case, remain utterly metaphysically given is the argument of how it becomes possible to overcome this correlationist counter-revolutionary obstacle. The speculative realists know very well that to retreat from the Kantian prohibition, means to fall back to the deeply rooted logocentrism of, say, dogmatic Cartesian metaphysics or to the necessity posed by the unavoidable causality that is found in the Spinozian or Leibnizian metaphysics. Speculative realists do not refute correlationism by means of a radical realism as (Laruelle, 1998) does in his non-philosophical thought, where Real is 'being-foreclosed to though' (one-in-one, vision-in-one); *"a Real that is neither capable of being known or even 'thought', but can be described in axioms"*. The intention to prevail over the correlationist barrier and to provide access, through an a-causal ontology - to a non-empirical reality - forces speculative realists to show that "*the correlationist critique of metaphysical necessity itself enables if not* ***requires the speculative affirmation of non-necessity***" (Hallward, 2008, p. 54). Apparently, the problem is that given the concept of causal necessity that the correlationists propose between the empirical and the non-empirical, there seems to be no way of rationally justifying it and in addition of accessing reality. Thus we return to the Humean problem of justification where it could be given only if causal necessity could be shown to be as rigorous as *logical necessity.* As Hulswit rightly states:

> *"Today, Hume's idea that regularity or constant conjunction is a necessary condition for causation is generally accepted. If HIV is the cause of aids, then HIV and aids are constantly conjoined. This view seems to agree with our common sense view. We expect similar causes to have similar effects. But Hume held that regularity is also a sufficient condition for causation."(Hulswit, 2004, p. 30)*

Thus according to Hume – and the other analytics including Kant- this is impossible and obviously unanswerable. Therefore Hume argues that the necessity we detect in causal relationships is illusory and that this idealistic attachment with the illusion is innate in our expectations, which are due to habit and therefore there is nothing we can do to approach reality apart from searching our own empirical world for this 'pre-

given'. This is a classical example of the absolutisation of regression in the empirical and a withdrawal from the full implication of the demonstration of the ways, methods, and practices that can lead us to different ways, methods and practices of demonstrate our (in)ability[129] to approach the real. This, as Meillasoux believes, is an abandonment of ontological speculation, is a retreat from dropping causal necessity and a return to the blind-faith of the necessity of the *habit* (as in Hume) or an irreducible component of *transcendental logic* (as in Kant) an infinite regressive collapse in drawing inductive inferences from ordinary experience.

The way out of the labyrinth, the (de)construction of the absolute in-betweening in the 'hall of mirrors' that radical postmodern traditions posited as necessary, *can be overcome by a radically genuine relational thinking*. Speculative realism provides an interesting theoretical device for understanding collaborative design practice primarily because of its principled assault on every superstitious presumption where existing socially constructed situations can or even should be accepted as naturally given or inevitable. Rather than focusing in the interpretation of second order observations, speculative realism shifts the philosophical interest in an actionalistic paradigm where the redefinition of the contingent real provides the grounds for creating it, rather than discovering it through a subjective anticipation. In this newly emerging tradition, situations of the actualisable are converted to a matter of uncaused contingency. Nevertheless, these ideas are not fully developed on the means of their material transformation and thus difficult to be grounded on a conceptual methodological framework that can be readily put to work. As (Hallward, 2008) concludes in his review of Meillassoux's book (Meillassoux, 2008), *"a critique of metaphysical necessity and an appeal to transfinite mathematics will not provide, on their own, the basis upon which we might renew a transformative materialism"*, and thus proposes that the correlationist turn is not to be thought as an excess or a necessity but rather a deficit of genuinely relational thought. At its current state speculative realism and its affirmation of absolute contingency, as a basis for understanding the real, compromises its capacity to provide the grounds for a concrete framework for the social (and the political) and thus communicative and collaborative interaction. But obviously speculative realists would not disagree with this argument. Their position never admitted to provide the dogmatic 'golden means' of understanding or transforming political and social situations, rather their arguments concerning the absolute contingency of any addressed situation, propose

[129] The paradoxical notion of (in)ability (inability and ability at the same time), is considered here as the only process that provides the means for creativity. The means to "try again, to fail again to fail better".

that such a possibility of change (and may-be creative intervention) is likely to happen in the 'future'.

The philosophical device that speculative realism provides, throughout its critique of the Humean and Kantian problematic, is that there can't be any contradiction in our arguments although the principle of factuality has to subscribe to the necessity of contingency. Therefore, what we learn from speculative realism is that we must provide evidence for this contingency. This contingency of the causal relata must be determined; must be defined in terms of properties. And if contingency and only contingency is necessary then everything that is to be existent is also contingent. Hence, in terms of this logic we cannot speak about what exists per se, because it is contingent, but we can describe it in a similar fashion to the (de)constructive philosophical account we described in the previous section of emergence and we further analyse in the following section. This (de)constructive practice tells us that representation is an important device that like the phenomenological account brings forward the necessity to describe not the facts of the real, but our account that attempts to describe. Therefore focuses on a quasi-representational (de)constructive practice, where representation itself is a subject of multi-methodological reappraisal. Meillassoux points out, in describing what is ontic and what is ontological, that: *"the fact that the thing is cannot be described. You can describe what it is, how it is, relation etc. but that reaction, substance, etc., are facts, and because they are facts you can only describe them. In my language this is ontical description. Ontical - concern with what there is. But ontological is concerned with demonstration."*(Meillassoux in Brassier et al., 2007, p. 392)

Therefore, like speculative realists, a (de)constructive theoretical account is an ontological account that never tries to determine what *is* but only about what it can be. This is a creative account, or an account about creativity, that talks of what it can speak about, and tries to describe what it is contingent in a factual way. Hence, contingency becomes an absolute emergent factual reality. This is not a necessity for describing the physical universe which is independent to thought. The absolute here is twofold, 'absolutely necessary' in the case of contingency, and 'absolutely independent' in the case of the physical Real and its detachment from thought. The (de)constructive account here is synonymous with the responsibility to ground these two absolutes, to provide the means for describing/re-evaluating the representational device - and thus transforming it to quasi-representation - that attempts to demonstrate and bridge the gap between scepticism and metaphysics (speculation and absolute reality)[130].

[130] Scepticism and metaphysics are historically enemies. But it is in scepticism that we discover how to realise metaphysics. For instance Descartes invented his new metaphysics influenced by

5.3 (de)constructive Ontology

The problem with many of the theories of the modern and the postmodern has been identified in their metaphysical assumptions. These theories either strongly ground their belief systems on a stable actual centre or dislocate it in the perpetual shifting of meaning. Therefore, knowledge production is always isolated in a meta-linguistic domain where essentialist assumptions rely outside of knowledge constitution. This tension reveals one thing: the urge of the classical/traditionalist, constructivist, and constructionist approaches to attempt, to engage in a position, which is either reduced to a single overarching paradigm or diverged from any type of construction. In all cases it reveals the existence of a metaphysical account that is able to 'construct' without providing the means of construction. This suggests that in order for the acting agency to understand the process of construction, it is required to 'put faith' on the need: 'to relate the production of meaning with an ultimately impossible but centred process'.

In order to de-essentialise this conservative argument, we need to relate the production of the reality of knowledge to an exteriority that is not transparently accessible outside our mode of engagement, but rather, ontologically accessible and inherent within the process of knowledge production itself. For this reason, we propose a (de)constructive approach, which has its exteriority in a function that is impossible to fully represent, likewise to the functioning of symbolic meaning, but which is also impossible to avoid in the process of meaning construction. Therefore, if it is impossible to avoid it in the construction of meaning (e.g., the process of argumentation in a social context) then it will also be impossible to avoid it in our reflections on the ontological anticipation of reality. This type of meaning-production is quite different from the constructionist ends and suggests a new way of understanding the articulation of new forms of the social. If constructionism is unable to suggest an explanation in terms of what motivates the production of social constructions, then the (de)constructionist argument proposes the formulation of an 'internal externality' that, although un-presentable, is responsible for the establishment of representation per se. This process of 'internal externality' is in a perpetual mode of radical (de)construction of its own self, by either locating the assumptions of the real internally or externally. In (de)construction there is not a central point where meaning is founded, but only quasi-representational means that can provide a temporal dislocation of meaning. This means that (de)construction exhibits a dual character: on the one hand it undermines any centred identities, while

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Mentaigne's scepticism. The same applies in contemporary scepticism (correlationism) which supports that contingency is contingent rather than accepting it as necessary.

on the other it establishes the foundation upon which identities are constructed. This recognition of the centrality of difference and meaning-dislocation provides us with a radically different understanding of the constitution of knowledge and meaning in social interaction.

The purpose of this section is, therefore, to provide the basic characteristic assumptions we should bear in mind when considering such a radical epistemological claim for the constitution of an ontological device that will support us in understanding the reality of social interaction. Accordingly we provide a set of issues that clarify this argument.

5.3.1 Ontogeny of Being

The notion of *ontogeny* is usually specified as the event/process of creation of being, with 'being' understood in the existential/ontical sense of the word (Heideggerian "what is"). Therefore, ontologically speaking, 'ontogeny' is a historical phenomenon that describes "*the history of structural change in a unity without loss of organization in that unity*"; ontogeny is of primary concern in autopoietic systems analysis (Maturana & Varela, 1979, p. xxi).

In our view ontogeny is defined to also denote the ontological dimension of analysis of the development of Being (Heideggerian "what is 'is'") itself, a development that exists within a characteristic circulation of construction and destruction, attachment and detachment. Similar to the notion of Being that Heidegger introduced in philosophy (Heidegger, 1962), Being is not to be thought as a subject, an object, or a spatial continuum, but rather as a self-motivated event that "*[Being] names (the presencing of) what is present*". Regarding Caril Bigwood's interpretation the Heideggarian Being

> *"… is not a being, not a God, an absolute unconditional ground or a total presence, but simply the living web within which all relations emerge…" (Bigwood, 1993)*

Along the same line, we support that Being is none other than the phenomenal world of life process. In terms of our ontogeny, it represents a realm of pre-reflective action that first authorises the existence of these apparently fixed terms of reflection; a notion similar to an *uroboric différance* "*which brings to presence an operation of differing which simultaneously fissures and retards presence*" (O'Connor, 1981) [Image 5-1].

IMAGE 5-1 - UROBOROS

Evidently, this notion of Being does not represent the concretised modernist and positivistic view, neither the relativistic radical postmodern "end of philosophy", where the abstract splitting of subjective and objective worldviews reached an apogee of negation and infinitely distanced themselves from the lifeworld. Within this ontological dimension of understanding Being, the purpose is to return to a rethinking of Being, although this might sound like a regressive turn.

Ontogeny of this kind can be seen (historically) through three characteristic stages of development within the ontological dimension. The *first stage* of development is the pre-epistemological period where reality is seen as a fluid totality. Observed from within the spectacle of immediacy, constancies are only relative to the perspective site of the observing actor. 'Objective world' appears to change, but in reality it is only the actor's Archimedean point of view that shifts loci. Similar to the Lacanian *imaginary* state (or mirror stage of development [Figure 5-16]), where object - subject asymmetry is denied, the detachment of the observational framework from the observing, gives rise to an ontogenic notion of rigidity that requests for detachment; in order to be further developed.

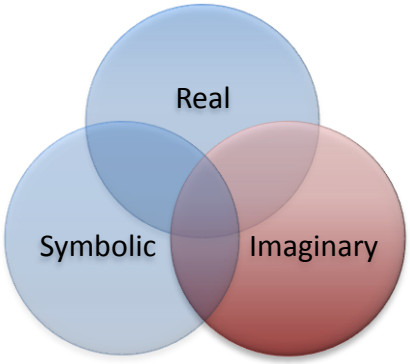

FIGURE 5-16 – LACANIAN IMAGINARY IN THE THREE REGISTERS

This is the development of the Being as a non-oriented topologically entity (point in space). A stage where object and subject are inseparable and largely undifferentiated, where object-in-space-before-subject has not yet occurred and differentiation is

about to come. In this first stage of ontogeny what is at stake is the distinction of subjectivity from objectivity as such. It is the moment where intentionality and the subjective ego facilitate their own development strictly in a process of detachment from themselves. This paradoxical process of differentiation gives rise to the coinstantaneous release and concealment of Being. In terms of semiotic analysis this stage can be seen in parallel to the Peircean 'firstness', where Being has not been referenced yet to anything else, primarily because it is impossible (it has no self) to appreciate otherness [Figure 5-17].

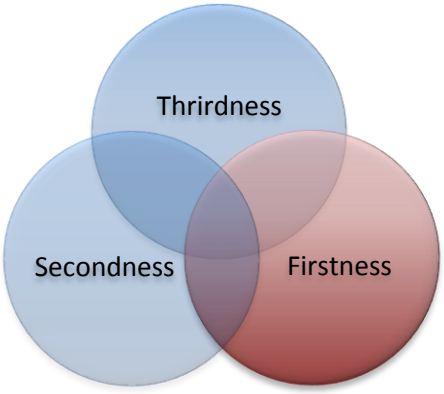

FIGURE 5-17 – PEIRCE'S FIRSTNESS IN THE TRIADIC MODEL OF THE SIGN

It is in Peirce's words:

> *"The idea of the present instant, which, whether it exists or not, is naturally thought as a point of time in which no thought can take place or any detail be separated, is an idea of Firstness." (A Letter to Lady Welby, CP 8.329, 1904) (Peirce, 1953)*

> *"The first is that whose being is simply in itself, not referring to anything nor lying behind anything" ('A Guess at the Riddle', CP 1.356-357, c. 1890) (Peirce, 1992)*

The *second stage of ontogeny* is advanced with the methodical consideration of consciousness that took place during the Renaissance and subsequently concretised by the dualistic thinking of Descartes. This is not simply a moment where self is divided to body and mind, but also the time when mind precedes body by taking an idealistic form and is considered in counter favour to the body. At this stage of Humanistic optimism, the subject becomes detached and disembodied. It is responsible for doing the knowing, responsible to elucidate the existence of Being.

> *"… what Descartes's work promoted was the abstraction of the subject, its detachment from the world of concrete bodies and happenings. By the same process, the bodies were relegated to the status of being mere objects; they were to be treated as merely*

> *factual, as having -in the words of Heidegger- 'no concealed qualities, powers, and capacities …[but being] only what they show themselves as' (Heidegger & Krell, 1967)" (Rosen, 2004)*

This is not to be thought as a purely negative development as it was seen by many radical postmodernists. Instead, in terms of a phenomenological observation, it is the unreflected Being's effort/chance to unveil. Alas, this act of openness failed in the modernist posture of philosophical dualism, of cogito's ontical closure, where Being moved away from itself and became a pure subject (*res-cogitans*), while nature was stripped from its subjectness and became a mere object (*res extensa*)[131].

In the mid nineteenth century the *third stage of ontogeny* of Being came into light [Figure 5-18]. The concretised Being of the structuralist mechanical era of the past is acknowledging itself, not by providing itself what is its own in the posture of moving away from itself (as in stage two), but *proprioceptively*[132], in a posture of emphasising its ontological status.

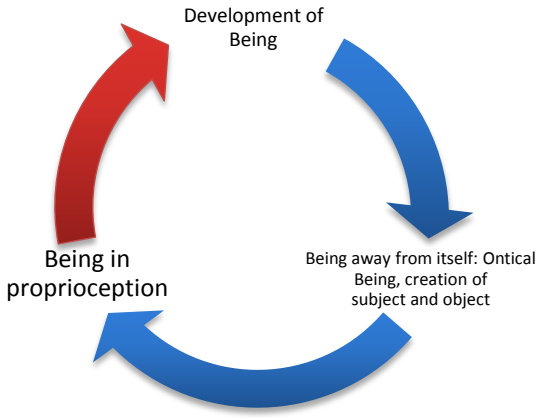

FIGURE 5-18 – THREE STAGES OF DEVELOPMENT OF BEING WITHIN THE ONTOLOGICAL DIMENSION

This is a paradoxical transformation of Being where object and subject are integrated. It is similar to the topo-dimensional representation of the Klein bottle [Image 5-2],

[131] In terms of social practice this is also to be thought as the root of pure individualism. This is a radical evolution from an Aristotelean philosophy, where the polis, i.e. the world, was anterior to the individual. With his new conception of the relation between the world and the subject, Descartes lays the basis of modern individualism; man does not need the world to prove that he exists.

[132] The term proprioceptive derives from the Latin, *proprius*, meaning "one's own", which can be read as a taking of self or 'self-taking'. This term is commonly used in physiology where it signifies on organism's sensitivity in its own body parts.

where to fully comprehend containment, we are in need to subvert classical interpretation of the notion of containment itself. In this conception, *the same (self) is not*; it is a real that resists absolute symbolisation although it might exist in the un-presentable real as a multiple (Badiou, 2007).

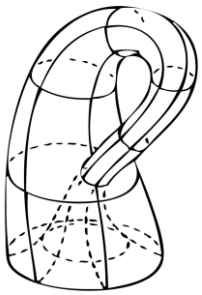

IMAGE 5-2 – KLEIN BOTTLE

The self-contained Klein bottle is subverting the Cartesian interpretation and its consequent categorical separation of contained object, containing space and uncontained subject. Its bounding vessel constitutes a space itself, a space different to the symmetrisation of the classical continuum where opposing sides are not finite particular structures. This topological metaphor of the Kleinian ontogeny has important implications for the understanding of Being. As Rosen states:

> *"… the 'sides' [of the Klein bottle] are constituted by objectiveness and subjectiveness per se. it is when the opposing elements of the Kleinian container are understood in this manner that they are no longer considered merely to be global features of a topological object-in-space; instead the 'sides' of the vessel are grasped 'locally', i.e., as features intrinsic to dimensionality as such. And the opposition and ultimate fusion of the 'sides' develop through the stages of Kleinian Ontogeny …"(Rosen, 2006, p. 103)*

By challenging the Wittgesteinian (Wittgenstein, 1969) approach where paradoxical interpretations, like Barthes's, are considered myopic ideas of how language actually adapts to flexible conventions of contextual narratives, Kleinian *synsymmetric dimensionality* (both symmetric and asymmetric)[133] provides a dialectical blending, where opposing terms fulfil each other as they permeate each other. In the third stage of ontogeny the meaning of Being can be seen in terms of the Kleinian (w)hole; both a thing-in-itself and an empty space, a hole, both self-containment and openness.

[133] According to Rosen, the Klein bottle is 'synsymmetric', because when "*it flows through itself as it does, the Klein bottle continually breaks and remakes its own symmetry*" (Rosen, 2008, p. 119).

In this sense, ontogeny of Being is a kind of creative excess, always accompanied by a surplus to the signified over the signifier, which places the first beyond reductionistic explanation. This is the gift of Being to itself where in the act of giving and receiving there is no gift as such (pure gift). Following a (de)constructive path this gift never comes 'to be' (never is), but it remains always 'to come' (may-being) - a process -, in the same manner that Being is configured under a speculative realist ontology (Meillassoux, 2007a). Gift and Being are the non-structural components of the same notion that consist, come into existence, because of their (dis)appearance of one onto another; the ways that these *are* is not that important compared to the possibility that they *might always be otherwise*. This is the logical contradictory notion of (non)presence that Derrida described as the aporetic mode of the ontogeny of Being. It is a mode of action far from nihilism, a paradoxical presence that reconstructive post-structuralists adopted to displace the rigidity of the structuralist project. Thus (de)construction here is seen as a constant, vigilant, reminder of what structuralism can become if it is to avoid the traps laid down by its seductive concepts of logocentric method(ism). Concurrently it also becomes a token that reveals the need for a transition from the agnostic scepticism of those who doubt the reality of cause and effect, into a radical certainty that there is no such thing as *causal necessity* at all. The *correlationist* (to be, is to be a correlate), Kantian prohibition of 'thought – being' absolute relationship where anything that is totally a-subjective cannot exist, is to be rejected (Meillassoux, 2008).

5.3.2 (in)dividuals

The individual in the traditional sense of the word is considered the indivisible subject, and often is related to the 'I' of the cogito. So to speak there are two distinct ways in seeing the Cartesian cogito[134]. The first and well known approach is based on the radical post-structuralist critique of the Enlightenment's humanism, where the Cartesian cogito by its relation to pure individualism, which is the basis of the centred subject or as it is more commonly known, the '*individual',* is undividable and fully autonomous; is the master of itself. According to the post-structuralist thoughts this is not the case. The subject is not and cannot be a fully autonomous being with the power of self determination but rather an effect of the structure of discourse where competing discourses intersect and speak through the subject. In this way the meaning of the subject in not at the centre of itself rather it is decentered or located outside the subjective self, in the competing discourses, dominant ideologies and histories of the present day. The second approach considers this post-structuralism idea as a return to radical structuralism of a different level of abstraction where an

[134] Although this idea is originally proposed by Saint Augustine (354-430)

'*absolute sign*' (e.g., discourse) speaks for the individual. As Žižek argues, the subject becomes a puppet of the overwhelming forces of the symbolic (Zizek, 2003).

If, the tradition of vulnerability (postmodernism and post-structuralism) tried to deconstruct the coherent autonomous modernist subject and thus to demonstrate that it emerges by and within a system of cultural and linguistic relations, our version of subjectivity (dis)places the subject from the margins of ontogeny and repositions it at the dialectical tension between self-actualisation and hetero-actualisation; subjects exist in a continual state of (de)construction between self and the Other. While at one instance, actualisation of the subject (self-development) seems possible, at the same time it is obvious that they are also reduced to the sociocultural systems, which function as a condition of their possibility. This paradoxical constitution of the subject is acknowledging that subjects are indeed socio-culturally and linguistically constituted, but at the same time supports the idea that the emergent subjectivity 'transcends' its very nature. Such a subject is 'always already' different to the system of relations from within which it arises and thus, remains capable to participate in new types of relationships; something that in the eyes of an interpretivist seem as the free choice and self-development. Following the affirmative postmodern tradition, (de)construction supports that subjects ($\mathbb{S}$) are never 'absolutely' free to choose, but are always already members in a network of relationships. Simultaneously, they are 'responsible' for making decisions by organising the network that they participate.

The individuals in (de)construction are therefore different. Similar to Actor-network theory, individuals are actants regardless of their nature; being animate and/or inanimate entities is less interesting for interaction at the level of the (con)text. Individuals are considered, as we will see in the following paragraph, according to a perpetual becoming, either as self-organised or as hetero-determined, and thus, they are fragmented. These fragmented individuals ($\mathbb{S}$) in (de)construction are called '*(in)dividuals*' and are dynamic symbolic entities that 'do things' or participate in the (con)text; observed as symbolic processes. The (in)dividuals in the (de)constructive ontological framework can be categorised in terms of their subjective agencies ($\mathbb{S}$) (when the focal level is at the level of the individual), and in terms of their mode of interaction and participation processes in the (con)text (when the focal level is at the level of interaction in the (con)text). These two categories cannot be seen independently, but are used for analytic purposes.

The first level of focus, speaks for the ontic level and refers to the (in)dividuals in terms of their '*continuous*' and '*discontinuous*' becoming [Figure 5-19]. In the case of (in)dividuals who exhibit a 'continuous becoming' (cannot retain their organisation), we speak of entities, which, when observed at the level of subjective agency, they do not exhibit any subjective behaviour themselves. In correspondence to the Lacanian Imaginary Order, these (in)dividuals deprive of the self-organising mechanism that is produced by the imaginary relation between the 'ego' and the 'little other', because

they lack a '*specular image*', and therefore their 'ego' is either fake, or non-existent. In the second case (in)dividuals evolve within a discontinuous loop of interceptions towards environmental perturbations and thus, exhibit a 'discontinuous becoming' (creative iterative way of being), where they self-organise to retain their autonomy and organisation. This type of (in)dividuals resembles to the Lacanian conception of the construction of the 'ego' through the 'mirror stage of development'.

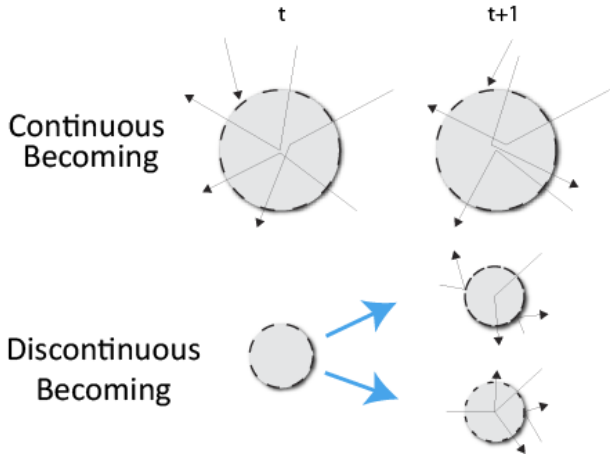

FIGURE 5-19 – CONTINUOUS AND DISCONTINUOUS BECOMING

Obviously, both 'continuous becoming' and 'discontinuous becoming' cannot be considered in terms of their ontic status alone. The environment that creates these entities within which they interact and create it, pose an important role in their becoming, and thus, they cannot be viewed in isolation to it. This understanding of becoming in terms of a relational, interactive becoming among (in)dividuals within a (con)text, poses the necessity for a second level of focus, that of interaction.

The second level of focus refers to (in)dividuals and their mode of interaction and participation processes in a (con)text. Accordingly, at this level of observation, '(in)dividual becoming' is related to three types of becoming within a (con)text: 'active', 'reactive', and 'passive' becoming. Following (Meillassoux, 2007b), an (in)dividual characterised by discontinuous becoming, is *"a discontinuous loop of interceptions"* - an openness to the world -, because it cannot entirely cut itself off from the influences of the environment. Accordingly, he refers to two elementary cases that present themselves as narrowing and broadening of discontinuities[135]. The 'active becoming' signals itself through an increased openness to a part of the fluxes

[135] The depicted dashed lines [Figure 5-20] do not compose a boundary, but the status of organisation (e.g., strongly or loosely organised). Lines indicate interception mechanisms, while gaps indicate discontinuities.

or perturbations that derive from the environment, while the 'reactive becoming' increases the power of disinterest of the living being [Figure 5-20].

Following the aforementioned need for an ontologically flat descriptive framework {see §5.3}, where all participants are considered a-symmetrically regardless of their nature, a third category is necessary for dealing with mixed (con)texts that include (in)dividuals of continuous and discontinuous becoming. This category is characterised by (in)dividuals of 'passive becoming' and resembles to the continuous becoming of (in)dividuals.

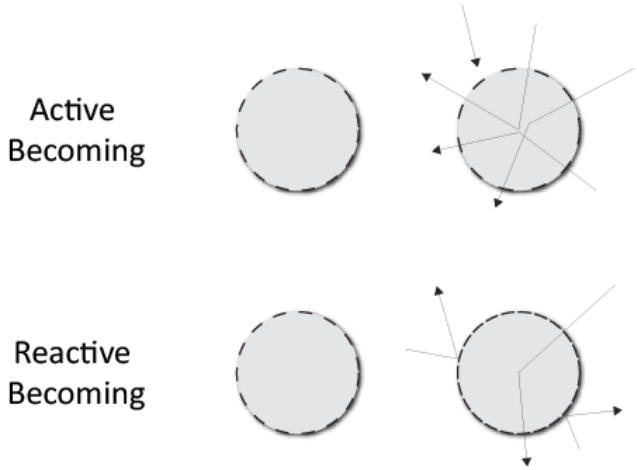

FIGURE 5-20 – ACTIVE AND REACTIVE BECOMING

An 'active becoming' is always manifested through the fact that something happens, and therefore, exhibits interest in perceiving this change in the environment, though, in order to register an increased affectivity to external influences, it is essential to express a 'passivity' towards their self-development. In terms of the Symbolic Order, 'active becoming' is observed as a 'barred subject' that is particularly interested in the influence of the environment (i.e., the 'barred Other'). It exhibits a 'weak' imaginary relation (a ⇔ á) (openness) and thus, its self-organisation is directed towards adapting an increased number of external influences (extrovert). It focuses on retaining the discontinuous loop of interceptions by an increased openness to a part of (con)textual fluxes [Figure 5-21].

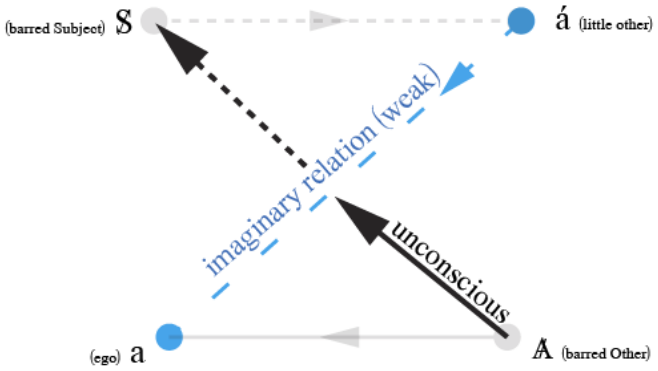

FIGURE 5-21 – ACTIVE BECOMING

'Reactive becoming' is a process in which the subject manifests itself "*through a disinterested retreat inherent to the very constitution of the living being*". Reactive becoming mainly focuses on identifying new ways (to self-organise) of conserving itself and its being, without opening out onto exteriority (introvert). In terms of its relation to the Symbolic Order, 'reactive becoming' is also a barred subject that is essentially inventive in closing discontinuities or strengthening the constraining mechanism of the imaginary relation (strong). It focuses on retaining the discontinuous loop of interceptions by an increased closeness to a part of (con)textual fluxes [Figure 5-22].

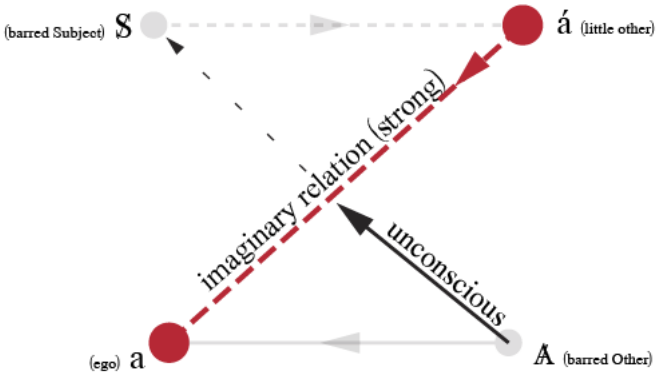

FIGURE 5-22 – REACTIVE BECOMING

'Passive becoming' is not related to any type of self-organisation, and displays a mode of ultra passivity to the influences of the environment (no interest in what happens). In passive becoming there is no ego, and therefore, in order to understand its interaction within a social (con)text we have to assume that it exhibits a 'fake' ego.

There are two types of evolving in a (con)text; either organised 'inwardly' by closing in (resulting to a 'reactive death'), or organised 'outwardly' by dissipation (resulting to a 'creative death') [Figure 5-23]. The first type of evolution tends to deprive communication to the world, while the latter opens communication. These types of evolution can be represented by the metaphors of the ultimate communicator or creative (in)dividual, who would ideally strive to achieve both a dissipative openness to its environment, and at the same time preserve its self-organisation by closing inwardly. This is a creative process, and in Meillassoux words can be described as the (in)dividual who:

> *"tends towards chaos when one invents, when one creates, but there is nothing one intents than actually catching up with it. It is at once a tendential and anti-regulative model: we must continually approach the chaos which governs the propensity to create, and continually guard against falling into it." (Meillassoux, 2007b, p. 106)*

This state of internal and external regulation can be paralleled to the regulation of the Lacanian '*jouissance*', which is a surplus excitation or bombardment of stimulation, which every creative (in)dividual tries to control. Too little or too much unregulated jouissance drives the (in)dividual to an excessive imbalance towards regulating its being.

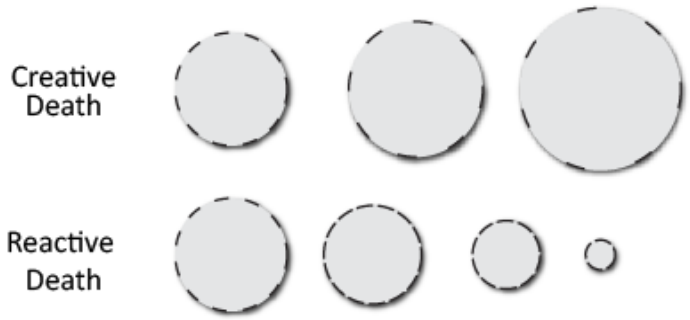

FIGURE 5-23 – REACTIVE AND CREATIVE DEATH OF THE REACTIVE SUBJECTS

Accordingly, an ontological observation of '(in)dividual becoming' is always relational and simultaneously continuous and discontinuous, while at the same time identifies interactions at the (con)textual level towards an active, reactive, and passive becoming. Therefore, for the understanding of (con)textual interaction, (in)dividuals must be seen both from the focal level of their (in)dividual becoming and also from the focal level of their becoming in terms of participating in a (con)text.

The three modes of becoming at the (con)textual level are closely interrelated, and for discontinuous becoming (in)dividuals they never happen in isolation. An (in)dividual that exhibits a discontinuous becoming, when performing in a (con)text, interchangeably is seen as an active, reactive, or passive, adaptive node of the (con)text. Depending on their observed interaction in the (con)text, (in)dividuals are

characterised by passive becoming, when no interaction (translation) is evident, while active and reactive becoming are two stages where interaction is characterised in terms of creative (introduces new connections and nodes in the (con)text) or reactive (attempts to stabilise existing connection in the network). As we have mentioned earlier, an ultimate communicator (creative) actually attempts both creative and reactive interaction with the (con)text, although a passive becoming might be interpreted as a process of participation.

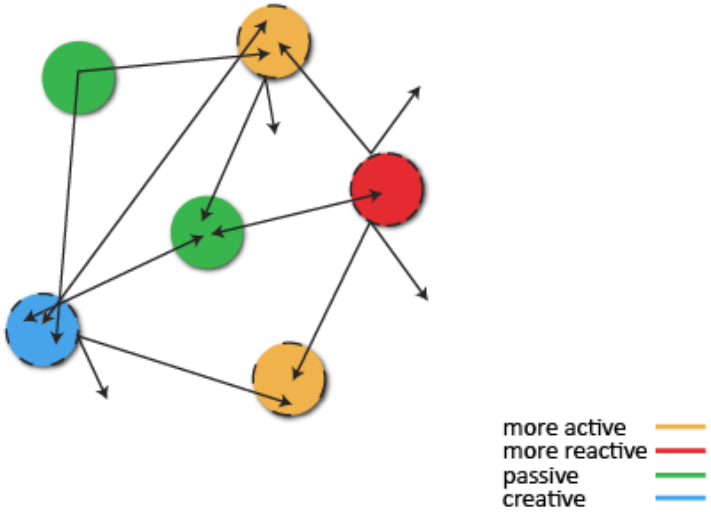

FIGURE 5-24 – INTERACTION IN A (CON)TEXT

(in)dividuals with continuous becoming are also important nodes of the (con)text, which because they deprive ego, their subject is represented by other (in)dividuals (e.g., green node on Figure 5-24) in order to exhibit active and reactive becoming in the (con)text. Therefore, through this process they can mobilise the (con)text, and consequently other heterogeneous (in)dividuals might 'do things' in the (con)text because of this interaction.

TABLE 5-1 – CASES OF (IN)DIVIDUAL BECOMING

	Becoming: focus on the level of (con)text			
Becoming: focus on the level of (in)dividuals		Active Becoming	Reactive Becoming	Passive Becoming
	Continuous Becoming	Through representative	Through representative	In the interaction with other (in)dividuals.
	Discontinuous	Increase openness	Increase closeness	Observed as a state of undecidability. Can

	Becoming	(extrovert), 'weak' imaginary relation, achieve autonomy through interest in the environment, broadening discontinuities.	(introvert), 'strong' imaginary relation, achieve autonomy through interest in self, narrowing discontinuities.	lead either to active becoming or reactive becoming.

As we will see in the following section {see §5.3.3}, where we analyse the role of the (con)text in the (de)constructive framework, (in)dividuals are not to be considered in terms of a their intentionality of becoming, primarily because an ontological non-stratified framework does not separate them according to their properties. Rather, intentionality is considered and observed at multiple focal levels of both (con)textual and particular interest. Therefore, intentionality can be described by the role of (in)dividuals in the (con)text as a type of non-purely-intentional intentionality, or in other words, a *non-subjective-intentionality*. This is a non-static type of intentionality based on the (Derridean) '*iterability*' of participation (languaging) in opposition to the purity of language (property). While traditional intentionality (the metaphysical concept of intentionality as presence) is based on ordinary language and is therefore, considered originary (causing existence), in this model all interactions in a (con)text are derivative or supplementary. This type of amphiboly, which is produced by the iterability of interaction (of language, communication etc.), is the pre-conditional trace for the very formation of communication and interaction itself. Hence, non-subjective-intentionality is always related to a mode of performativity or iterability of interaction, which does not cancel traditional intentionality, but only places it in a perpetual mode of configuration. If this (de)construction of intentionality undermines the concept of pure consciousness, then any theoretical foundation of a pure subject is also challenged. In (de)construction the subject is the Derridean or Lacanian non-singular identity, non-Cartesian cogito. The subject is always related to an (in)dividual with a consciousness and unconsciousness, with a saturated capacity to hold pure meaning. This does not cancel subjectivity altogether, but also it does not centre its foundation in any type of pure locus (e.g., the unconscious). For this reason, intentionality involves the (de)construction of subjectivity, which in this thesis is represented by the barred Lacanian subject ($\mathbb{S}$) that exists in the Symbolic Order, while individuality is a spectral concept, which cancels the metaphysical presence of being.

5.3.2.1 Coevolving of (in)dividuals and the (con)text

Therefore, (in)dividuals and (con)texts evolve together (co-evolve). (in)dividuals are constituted on the basis of a self-referential nexus of conscious and unconscious states, while (con)texts are constituted on the basis of a unified (self-referential) nexus of communication, interaction, and collaboration processes. Co-evolution denotes that (in)dividuals become the necessary environment for the social systems to evolve and the vice versa. This can be seen as correlate to the ideas of Luhmann where, "*Psychic and social systems have evolved together. At any time the one kind of system is the necessary environment of the other. This necessity is grounded in the evolution that makes these kinds of systems possible. Persons cannot emerge and continue to exist without social systems, nor can social systems without persons*[136] " (Luhmann, 1996). Although both (in)dividuals and (con)texts draw their choices from meaning, emergent in social context, and at the same time shape this horizon of meaning because of their capacity to network and interact, this does not denote that both systems take common actions and choices. Their structural couplings can be identified by their interaction, and because of the non-permanency in the expression of interaction, correlation of their actions is not implied. The placement of (in)dividuals on the horizon of (con)texts, releases the potentiality to independently observe the actions performed without restricting (in)dividual creativity. Creative (in)dividuals are circularly organised through their cognitive experiences influenced by bodily, biologically driven, senses, but are seen as black boxes and therefore we cannot speak of their true inner being. This circularity enters a second loop when coupled with the socio-cultural horizon of the (in)dividual. This is similar to the notion of *enaction*, introduced by (Varela, 1992; Varela & E. Thompson, 1993), in order to bridge the separation of matter and mind as described by the traditional Cartesian thought. According to this, the (con)text permits the actualisation of the (in)dividual subject, while the (in)dividual subject throughout its internal structure collects from the environment those elements that will define its own world and structure the horizon of other systems. This is very close to the thoughts of (Merleau-Ponty, 1983): "*it is the organism itself according to the proper nature of its receptors, the thresholds of its nerve centres and the movements of the organs which chooses the stimuli in the physical world to which it will be sensitive. The environment emerges from the world through the actualisation or the being of the organism*". In order to express this idea at the level of human cognition, (E. Thompson & Varela, 2001) introduced the term *embodiment* to signify that human consciousness is bound to the materiality of its

[136] Luhmann notes that this has nothing to do with the conclusion that is drawn by the tradition: "that the human being, as an *animal sociale*, is part of society, and that society is thus composed of human beings." This contradicts with (de)constructive ontology and thus pointing back to structuralism.

organic structure. Following this they assumed that there is no consciousness outside the reality of bodily experience and we add here that there is not intentionality independent of the (con)text of interaction.

5.3.3 (con)text as a Systemic Network

(con)text or systemic network, is a central concept for (de)constructive theory. Following systems theory, Actant-network theory and (de)construction, the term of the (con)text can be defined as an observed system or a network of dynamic relationships and processes that occur among dissipative structures and the context of the network itself. The (con)text has a unified dual character; it is being observed (by an observer) as a 'text' or a system and, at the same time, provides to this observer the grounds for observation. A (con)text's actual existence is not necessarily established by the observation, and it well may have happened because of other 'unknown causal' relationships independent of any possible observation. Therefore, (con)texts are observed or 'read' in terms of a meta-hermeneutic epistemological ground, where observation of the context and the constitution of its description (text) co-evolve within the network of a (de)constructive observational processes. This is a process of mutual shaping between the observer and the (con)text.

Classical Systems Theory has put a lot of effort in understanding the basic structure of systems, the way their parts are hierarchically grouped into collections, the interrelations that exist among parts and collections (wholes), the relations between wholes and the environment, and the purposes of the system design through the analysis of systems thinking processes, methodologies, and theories. The divide in contemporary systems theory can be seen between those who support that structure and functioning are two inseparable issues for understanding the systemic behaviour/nature and those who accept that the identification of quantifiable notions (e.g., boundaries, feedback structures, attractors, observational data) that represent the structure of the specific elements, are enough to provide the basic means for understanding systems in general. Examples include the paradigms of complex systems, which identify the development of spontaneous structures from disequilibrium conditions (Prigogine & Stengers, 1984).

Systems, complex systems and in particular open systems engage in a variety of different processes far beyond the status of their constituent parts. As a result the (de)constructive approach of (con)texts focuses on analysing a systems-as-process philosophical metaphysics for the analysis of systems instead of substance metaphysics (mostly evident in palaeo-systemic approaches). Thus, those systems or (con)texts are examined in terms of the interactions of parts (i.e., (in)dividuals) rather than the qualities/properties of the parts per se. This means that a (de)constructive ontology for (con)texts understanding is based on the assumption that those (con)texts are modelled according to processes where (in)dividuals collectively form a steady foundation among which (con)text processes emerge and thus, observed. The concept of observation is not a linear process of perception, but is realised because it

is involved in the collective behaviour of the (con)text, while, as we said, defines the (con)text. This interpretative process concerns the establishment and maintenance of a 'boundary-less' boundary of the (con)text[137]. This philosophical approach of (con)texts involves: 1) an overturning of several standard conceptual and explanatory defaults about substance metaphysics and therefore, the constitution and existence of (con)texts, and 2) enables posing and exploring new questions and explanatory frameworks.

A theory of (con)texts, therefore, acknowledges that while differentiation and change is the most important consideration of the systems' nature, dynamic structure characteristics and convergence are also important. Following the scope of contemporary systems' theories, which is not to 'cybernetically' control hypothetical/observed systems but instead to provide a deeper understanding of the nature and processes of change in those systems, a theory of (con)texts also accepts such an ontological ground. Hence, everything, including (in)dividual entities, relations, and wholes, become processes (though their material nature is not disavowed) of networked relationships that have a number of characteristics regardless of the theoretical device that we use when observing them.

One of the most important issues in any system, context, or network theory which relates parts and processes is the concept of '*boundary'*. Contemporary theories, like Actor-network theory, the theory of self-organising systems, autopoietic theory, and other theories of dynamic systems, attempt to undermine the concept of boundary and consider it as a *'boundary-less boundary'*. The (de)constructive process metaphysics ontological framework also challenges the notion of 'boundary' as a 'conceptual instrument' to distinguish and describe entities (which essentially are processes) and instead, proposes a non-stratified, flat ontology based on the metaphor of 'Klein bottle'[138], which obtains its existence from its discontinuity (in the hole[139]) and thus, presents the characteristics of closeness (it has no boundary itself), continuity (tangential) and openness (does not divide space). The characteristic of openness provides a conceptual device for distinguishing entities, not in terms of a

[137] As we will present in the following paragraphs, this paradoxical character of the boundary can be outlined according to the metaphor of a Klein surface.

[138] A Klein surface is a closed and non-oriented surface; this means, respectively, that it has no boundary itself and it is one-sided (the 'two sides' of the surface are actually one side), thus it does not form a boundary of the space it belongs into.

[139] The necessity of the hole denotes that space is unable to contain the bottle the way ordinary objects appear containable (Rosen, 2006), and thus, establishes the continuum in the phenomenon of 'passing from one side to another'. The role and the importance of the hole in the (de)construction framework is further analysed in the following paragraphs.

singular notion or structure, like the boundary, but in terms of a process of perpetual redefinition of formal flexible boundaries that exist in a meta-ontological level (boundaries that are created ontologically but also signified in terms of observation). This (de)constructive process metaphysics introduces a new type of 'causal relata' primarily because it involves the processual interaction of past events in which the constructed evental site (which is open-ended) can anticipate the events that are possibly to be taking place in the future. The characteristics of continuity and closeness provide the counterpart of the first conceptual device and are used to describe dynamic entities by eliminating the possibility of a metaphysical leap in observation (e.g., crossing the boundaries that are set by the observation). These characteristics, therefore, function at the epistemological level and attach the observer in a process of observing, based on the dynamics of the (con)text (related to theories, methodologies etc. that emerge in the network), and thus, avoids a metaphysical enlightenment.

A (de)constructive ontology of this type that attempts to describe, at a symbolic level, the processes that occur in the (con)text, is based on the tripartite description that Lacan introduced in order to relate the subject, the symbolic relations that emerge in the social, and the actual. This framework positions the symbolic meaning processes on the three dynamic Orders (the Imaginary, the Symbolic, and the Real), which in our case they can be illustrated in terms of three interconnected Klein bottles [Image 5-3].

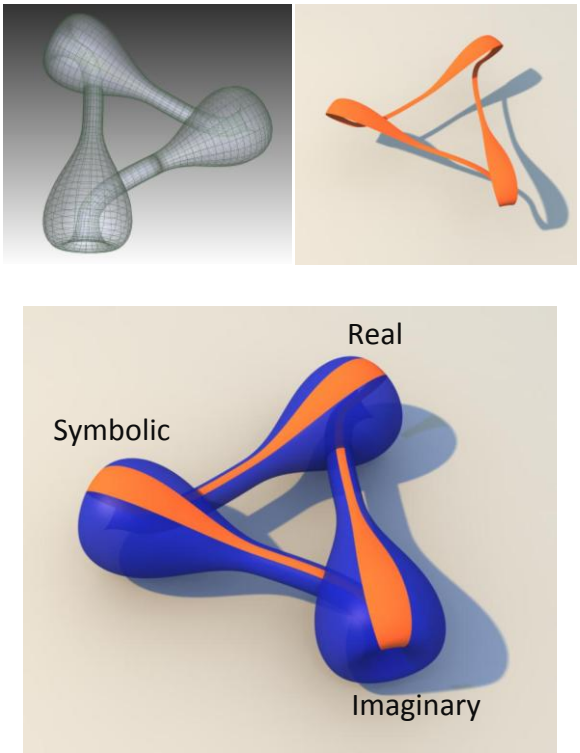

IMAGE 5-3 – THREE KLEIN METAPHOR FOR THE IMAGINARY, THE SYMBOLIC, AND THE REAL

At this level of abstraction, the first Klein corresponds to the Imaginary state, where the subjective attempts to establish itself, the second resembles the symbolic relationships that evolve at the inter-subjective level, while the latter can be paralleled to the realm of the Real, which resists symbolisation. Our suggestion is that the Klein bottle's absent-dimension refers to the ontological dimension of every single order. Therefore, the Klein bottle represents, as a metaphor, an intersection with the world of meaning. The linking of these three orders, through the depiction of three Kleins, gives us the ontological device that ensures the continuum of the emergence of meaning, independent and free from the classical philosophical attachments to either of these orders (e.g., idealism, hermeneutics/constructionism, realism).

For the analysis of such a (con)text, which involves the interpretation for a subjective, and includes its relations to a social and a material real, we are to provide a number of characteristics for demonstrating its nature. These characteristics include:

- (con)texts' nature is unpredictable,
- Change is the basis of existence in any (con)text,
- (con)texts and participating (in)dividuals are seen as processes,
- Normativity and intentionality in/of the (con)text.

Specifically, a (de)constructive process metaphysics has a number of assumptions in the way we understand those non-linear, complex, open (con)texts and their characteristics. The first characteristic regards the nature of the (con)text and its unpredictability. (con)texts do not emerge arbitrarily but are based on the dynamics of the environment that brings them into circulation. The plurality of the environment affects the nature of a (con)text and makes it unpredictable; a number of different (in)dividuals might participate in a (con)text and they can produce a number of different alignments among them. This unpredictable nature of the (con)text primarily stems from the involvement of the chaotic processes that occur among the relations of the Imaginary, the Symbolic and the Real. For example, fragmented (in)dividuals, with disparate backgrounds, conscious and unconscious drives and desires, confluence each other within a complex socio-symbolic network of rules, norms and regulations, beliefs, and other social constructs based on the interaction with an un-symbolised material world.

The second characteristic derives from the first and refers to the transformation of processes in a (con)text. Stability, as we will see in the following paragraph, of the (con)text as a whole, is heavily based on local changes. These changes pose the basis of the existence of any (con)text and occur spontaneously because of the dynamics of the network. This spontaneous, 'impulsive' character of change can be paralleled with the autopoietic self-organising nature of complex systems. If compared to the

(de)constructive tripartite Orders, then change is an inherent characteristic in every Order. Reactive (in)dividuals continually self-organise by redefining their egos, the social structures continually communicate their changes and alter their structure and functioning, thus, reproducing a dynamic understanding of the subject and the Other, while all (in)dividuals form dissipative systems of a fragmented structural nature.

The third characteristic is related to the radical shift in understanding (con)texts as processes rather than substances. The (de)contructive ontological framework is profoundly based on process metaphysics. This type of metaphysics undermines classic substance metaphysics but also tries to avoid a non-logocentric understanding of processes as quasi-representational means for describing both materially fragmented unities and dynamically formed processes, which can temporarily be observed as events. This is a fusion of material and process metaphysics and describes the (con)text as an evental site. It is obvious that the (de)constructive model understands the three Orders themselves as processes, as well as the interaction among them.

The fourth characteristic of the (de)constructive process metaphysics accepts that normativity and intentionality might be themselves emergent properties of the interaction of the parts and the network rather than inherent behaviour of the participating entities or the network. Many philosophers consider intentionality as ontological distinct from phenomenal consciousness, a strategy that is called ‘seperatism’ (Horgan & Tienson, 2002, p. 250) or ‘insulation strategy’ (McGinn, 1991, p. 32), often called the “Thesis of Separation”(Kenneth Williford in Forrai, 2005, pp. 143-156). In our view, following the Lacanian paradigm normativity and intentionality can be ‘naturalised’ within a process metaphysics that includes the inter-relation and confluence of an Imaginary Order of the (in)dividual with a socio-symbolic and un-symbolised Real.

The dynamics of (con)texts can be characterised in terms of:

- Construction or convergence towards equilibrium (stability).
- Deconstruction or divergence towards differentiation and communication.
- (de)construction or creative interaction for achieving/retaining balance between convergence and divergence.

In the process of construction, the (con)text develops (itself) towards aligning (in)dividuals in a manner of downward determination, while (in)dividuals network for the development of the (con)text. This is a process of mutual shaping between (in)dividuals and the (con)text, and by this process of development both (in)dividuals and the (con)text perpetually change and co-evolve. The initialisation of a (con)text can be brought forward for many different and unknown reasons, and this is the actual a-causal character of the network’s own formation. It can either happen because some kind of amorphous organisation (an organisation to be; not yet

observable but functioning) aligns additional, different (in)dividuals, or because an (in)dividual of an existing (con)text transforms the dynamics of the network and produces a new one, by incorporating new connections with other (in)dividuals from different domains. While all (in)dividuals are considered equally important in the (con)text, the only difference in terms of influence can be seen in the number of (in)dividuals that one can employee in the (con)text. In the convergence process, (in)dividuals seemingly attempt to build new connections in the (con)text by a mutual process of agreement. This agreement is only observed and does not form a real consensual process like in Habermas. In reality, we speak of a collaborative process, where (in)dividuals, by interacting, initialising, or breaking links among them, coordinate their actions. Within this process of self-organisation the (con)text seems to converge towards an organisational closure of stabilisation and equilibrium. The capacity of the (con)text to return to a previous stable situation without disintegrating, means that the organisational closure of the (con)text has been stabilised to a level where the complexity of interpretative meanings for entities of the (con)text has been minimised to a level of predictability and thus, ensures this phenomenon of consensual character. As we will see in the process of deconstruction, often these stabilised 'behaviours' of the (con)text is necessary to further differentiate it in order for the (con)text to evolve.

Deconstruction is an important process that continually takes place within the history of (con)text development. By adding new (in)dividuals to the (con)text, the dynamics of the (con)text increase and diverge. Deconstruction is not a destruction of the (con)text itself, but a central process of self-organisation that focuses in amplifying the growth processes of the (con)text. It seeks for heterogeneity within the (con)text by trying to link diverse (in)dividuals. Therefore, deconstruction 'unfolds' the (con)text's organisation in order to allow the possibility of self-differentiation. This process of deconstruction is an exploratory process of re-evaluation and experimentation to unimagined connections. This is not necessarily a conscious or intentional process, but often is related to the unconscious and habitual character of the fragmented (in)dividuals or the dynamic capacity of the associations among the latter. The process of deconstruction it has the characteristics of an open communicative process and resembles to the active becoming of the (con)text.

Evidently, similar to the analysis of the becoming of an (in)dividual, where stability is the result of a perpetual process of openness and closeness, in the case of the (con)text construction and deconstruction by themselves cannot be seen in isolation too. Therefore, here we propose a (de)constructive process metaphysics that can deconstruct the tautology of determinism and predictability that is manifested in chaotic systems, but also incorporate the differentiation that is necessary for a creative becoming. In the (de)constructive process, (con)texts are observed as creative not when they exhibit one of the aforementioned processes, but when they

have the capacity to interweave them (both converge and diverge as well as retain the capacity to (de)construct). Therefore, (con)text's self-organisation accepts, as central for the achievement of stability in its organisation, both the reduction of complexity in the environment and also the incorporation of new heterogeneous elements under its influence. Hence, (con)texts are in a perpetual state of seeking a 'non-equilibrium equilibrium', a critical two-sided condition where stability and variation are considered necessary. In order for a (con)text to evolve, it must be in a creative state to stabilise itself in an unstable critical condition. To achieve this paradoxical state of 'jouissance', the (con)text must exhibit an anticipatory behaviour towards the construction of new and creative methods that link and keep in relation its constituents, but at the same time have the ability to reproduce their alignment or diminish/dismiss them. This (de)constructive process is to be resembled as a unity of this difference, or it can be represented by the paradoxical notion of the hole of a Klein surface, which is neither a hole, in the spatial container, nor a hole in that which it contains (Rosen, 2006, p. 35). The hole or in our case the (de)constructive process is the 'necessary' semantic dimension or the quasi-representation, which at the same time participates to the construction of meaning/objectile (Klein surface) and to its deconstruction. Therefore, this act of meaning/Klein surface development acts towards its self-containment, and is characterised by a (de)constructive process towards (w)holeness, where any kind of dualism (is/is not, inside/outside) is seen as a unity of its difference. The metaphor of the Klein bottle provides a device for understanding this continuous flaw of meaning, something impossible with two-sided surfaces. At the same time, the 'boundary-less boundary', negotiated in the Kleinian movement, is represented in terms of an interiority that deprives metaphysical exterior.

To further explicate the (de)constructive process, we propose that it can analysed to three processual components that clarify the development of each individual Order, through the creation of their corresponding holes, and at the same time elucidate the development of meaning on the surface (signification process). These processual components are '*differentiation*', '*translation*', and '*stabilisation*' [Image 5-4].

- *Differentiation* is related to the deviation of stability by simply questioning or rejecting its expectations for permanency. Differentiation attempts to produce the 'non-material material', the trace which contributes to the formation of variation (it provides the means for opening the surface and creating the hole), or to the establishment of the necessary discontinuity on the surface of the 'local' Order.
- *Translation* is related to a process of selection that involves creating the necessary converging relations that 'promise' the dynamic development of a stable structure. For this reason, it produces the necessary discontinuity of the hole, and thus opens up the horizon of possibilities for the paradoxical creation of the surface. Translation is a process that gives birth to the quasi-sign that supplements the signification.

- *Stabilisation* is the process where the trace becomes a form of temporal existence. While this form is stabilised, it also gives the appropriate grounds for its further development within the chain of signification, which resembles the (de)constructive process.

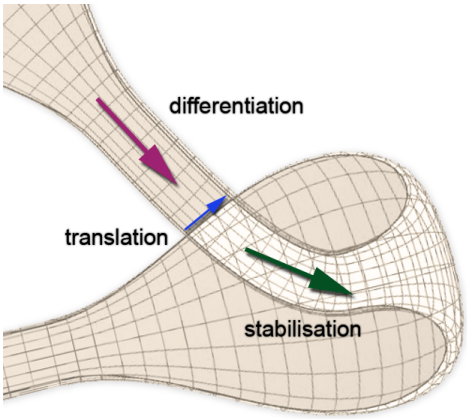

IMAGE 5-4 – (DE)CONSTRUCTIVE PROCESSUAL COMPONENTS AND HOLE CREATION

These three processual components, when related to the signification chain of the three Lacanian Orders, resemble meaning production that occurs on the surface of the three Kleins, and relate the Imaginary with differentiation, Symbolic with translation, and Real with stabilisation [Image 5-5].

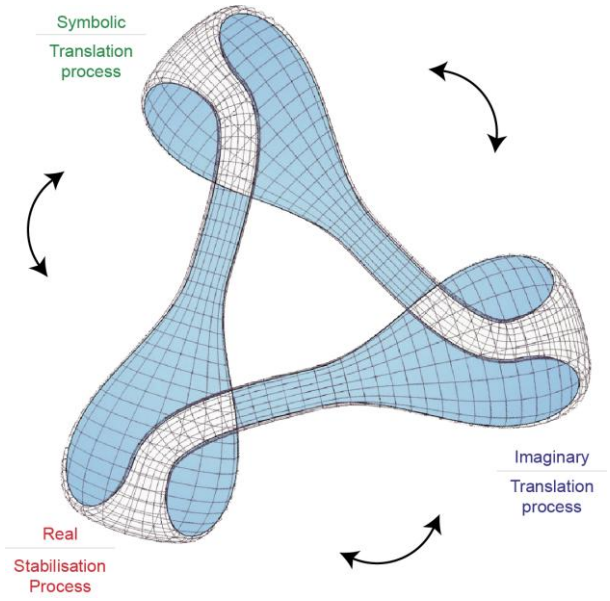

IMAGE 5-5 – (DE)CONSTRUCTIVE PROCESSUAL COMPONENTS ON THE THREE-KLEIN SURFACE

Therefore, the process of (de)construction 'performs' downwardly, but also emerges upwardly. This means that (in)dividuals introduce to the network new intermediaries or links to other (in)dividuals that bring with them the necessary means for

(de)constructing the (con)text. This process can be paralleled with autopoietic System's Theory notion of *'structural coupling'*. Obviously this is an a-causal process that is introduced in terms of formal logic, where future events (e.g., driven by quasi-anticipatory processes) 'cause/determine' new types of organisations and therefore, processes are materialised. An example here can be given in terms of the incorporation of new methods and methodological means in the (con)text by certain (in)dividuals who intervene in order to alter the state of a situation. These (in)dividuals (or interveners), by proposing, developing, or applying new methodological tools (introducing them as (in)dividual entities and linking them in the (con)text), allow the (con)text to reconfigure itself. This process of (de)construction and the introduction of new methodological means cannot be constrained in one domain or paradigm, nor to the static acceptance in the (con)text. Itself, the development of new methodological means is complying to (de)construction.

In conclusion, (de)constructive process-metaphysics ontological framework for understanding (con)texts can provide an interesting device for understanding other domains of systemic character (e.g., collaboration, communication, interactive activities such as design etc.).

5.3.4 Representation and quasi-representation

Representation is the classical signification, concerns the existence of a 'thing' in the actual. Is the substitute of this 'thing-in-itself'. The process that defines it (classical signification) refers to the relationship between the *representation* and the *object* and tries to maintain the stability of this relationship by preserving the anonymity of the former (Rosen, 2003). The process of signification itself is marginalised and attention is given primarily to the structured meaning of the components which are prearranged. With post-structuralism and postmodernism and the advent of semiotics this assumption about the nature of signs is undermined. In semiotics the sign acquires a different character, it becomes recursive, and instead of dealing with the process of the signification it also concerns the nature of the signs themselves. The sign therefore is a subject to itself, it refers back to the traces that constitute it, and thus, its representament is also signified. Representation, therefore, is not a linear process of sign formation but becomes a networked process, which exists only in comparison to an interpretant and a signified object {see §4.1}.

One of the important characteristics, inherited from the post-structural/postmodern thought, especially in the work of Jacques Derrida, is the denial of the transparency of language. This supports, that the idea of presence - where the meaning of a notion/concept is 'present' when the notion/concept presents itself - creates the illusion of a static understanding of meaning. Representation (including philosophies of representation), is therefore, not to be seen as a genuinely universal vehicle of meaning transference, but rather, as an expression which is relative to subjective interpretation, symbolic reality and reality that resists symbolisation. Thus, representation *is not* and *it can not be* considered an intermediary device that

transports the noumenal meaning of a real existing object to a mind. Also, representation, is not to be considered a process of infinite repetition and recursion (as in radical postmodernism), where signs perpetually refer to themselves. Evidently, semiosis attaches itself to some type of temporarily-stable representation in order to become able to continue its process of differentiation of meaning. This obviously is neither the classical structuralist linking between signifier and signified, nor the post-structuralist process of infinite regression. Is a process of in-betweening that entails neither external reference nor self-identity. This is a quasi-representational process that suggests the dialectical interplay of a substitution process (external reference) and attachment or self-identity (of a quasi-structure).

Having a model of representation that is able to represent, construct, and deconstruct (including its own beliefs) is the only means to cope with the contradictory character of dualistic/metaphysical conceptions of meaning. A relational model of quasi-representation should therefore provide the ways to:

- identify and thus represent,
- provide temporal meaning ‘structures’,
- destabilise the boundaries of fixed meaning ‘structures’, (relate ‘structures’),
- prohibit contradiction (e.g., boundary crossing),
- point out the contradictions that follow from the closure of any of the aforementioned conditions (deconstruct),
- fight against closure.

Representation therefore in the (de)constructive ontological framework is the result of a non foundational (dualistic) and a non-correlationalist (non-Kantian) understanding. Representation is neither to be considered as the direct depiction of an actual object, nor the idealistic counterpart in a subjects mind. Moreover, representation is not the correlation of the two. Representation in a (de)constructive theoretical framework is related to the triadic ‘co-operation’ of the representation itself, an interpretation and a corresponding object. This is a quasi-representational understanding of representation where the product of what is present is the product of the relation of three different orders, those of the Lacanian psychoanalytic model: Imaginary, Symbolic and Real. What is present can never escape this relationship[140]; it is at the same time a product of the three orders, or a semiotic sign (in Peircean terms) that resists stabilisation. Following the post-structuralist understanding of the

[140] What exists can possibly exist in one of the orders but in not presented or it does not have meaning, yet.

process of semiosis, representation is always related to a process of infinite semiosis, an endless reproduction of signs.

The process of (de)construction itself is an interesting example in drawing out the process of quasi-representation; primarily because it explains how the separation of the dualistic conception of the sign (representament-object or signifier and signified) takes place and thus leads to both dissemination of the sign and a resulting trace (a quasi-sign). (de)construction is the interpreter's contribution in the sign formation and thus it affirms its triadic character. (de)construction is 'responsible' for splitting (interpreting) the Saussurean sign and thus constructing a quasi-sign where its representation (the signifier) is constructing the object (the signified) and reversely the object is constructing the representation filtered through a process of interpretation. Therefore we can never speak for a genuine representation but of a quasi-representation.

In information processing, (de)construction moves a bit further from: 1) the classical semiosis where models of language and the mind work with systems of production-rules and are explained in formal and representational terms but also moves away from, and 2) the post-structuralist semiosis where models of language and the mind work with systems of relationships and are not understood in representational terms. (de)construction provides a model of semiosis where models of language and the mind work with systems of relationships that are not understood in representational terms, but with quasi-representational processes, which are the only means to approach them, although they will never present them in their completeness. (de)construction is not a subject to static structural representation, or victim of an infinite regress.

TABLE 5-2 – CLASSICAL, POSTMODERN, (DE)CONSTRUCTIVIST SEMIOSIS

Chmosky/Fodor	Derrida/Lacan/Freud	(de)construction
Models of language and the mind work with systems of production rules and are explained in formal and representational terms	Models of language and the mind work with systems of relationships and are not understood in representational terms	Models of language and the brain work with systems of relationships and are not understood in representational terms, but these are the only means to approach them, although they will never present them in their completeness.

5.3.5 Meaning Process in a (con)text

Hermeneutics and other phenomenological accounts retained the idea that interpretation had to penetrate the surface of an object (e.g., a text) or a subject (e.g., mind, agent) to reach its internal depths, where truth was to be found. Therefore, these approaches retained the traditionalistic idea of a boundary between the external and the internal, and it was only the Derridean project of deconstruction which dared to question this assumption. However informative, the Derridean project, in its radical form of vulgar postmodernism, raised signification to an infinite process, where reintroduction of the same problems in the proposed solutions became an endless semiotic game. Nevertheless, not all regression processes are vicious, and these are mainly the ones that, though repetitive in nature, temporarily pause in order for new and creative ideas to be tested within the problem content situation. Failure of the ontological grounding of an idea is not a problem for (de)construction, but a vital element of its processes. This means that in (de)construction meaning is continually created and evaluated, and if current meaning does not provide 'answers' (i.e., is capable of retaining its validity within a network of symbolic interactions), then it is to be re-placed. (de)construction, thus, recommends the close 'reading' of forms, both as '*differences'* and '*unities*'. Attention to differences, means to look at distinctions without accepting unity at a metaphysical level (rejects the position of a sublime knower/interpretant). Attention to unities means a temporal acceptance of a quasi-structure or an objectile that is represented by a difference and reintroduces another difference. Meaning for (de)construction is not permanent, but temporarily 'available' within symbolic chains of continuous semiosis.

In the (de)constructive approach, meaning is the result of the interaction of the three Lacanian orders. As we have seen earlier, the metaphor of the three Klein model provides the flat ontological device to represent the emergence of meaning in the subjective (Imaginary), the social (Symbolic), and the un-presentable Real. Similar to the Peircean semiotic model of the sign, where the interpretant, the representament, and the object exist in a coherent relationship in order to structure the sign, meaning production in (de)construction is a continuous movement on the surface of the three Klein model. Following the Peircean sign development, the Interpretant (I), the Object (O), and the Representament (R) are related. As we have seen in a previous section {see §5.3.4}, the triadic sign formation takes place in terms of: the constitution of the representament by an object related to the interpretant (R → O, I), the constitution of the interpretant by a representament related to an object (I → R, O), and the constitution of an object by a representament related to an interpretant (O → R, I). Therefore, semiosis in Peirce is based on the continuous development of signs within symbolic chains of triads. A similar process is taking place on the three-dimensional 'continuum' of the three Klein model. Based on the aporetic character between the continuity and discontinuity that the Kleinian hole produces towards the

development of the Klein bottle, we observe that this hole represents the basic components of a sign (R, O, I), when considered for every single Lacanian Order. For example, the hole that (de)constructs the Klein, which represents the Imaginary Order, at the same time inaugurates the necessity for the formation of the other two holes (R, O), which in turn (de)construct the Kleins of the Symbolic and the Real, and therefore provides the necessary surface, three-dimensional continuum for the possibility of the existence of the hole (Imaginary) itself. This process of (de)construction is not represented by a linear symbolic chain, which requires the metaphysical assumption of the Interpretant, as a third term of a triadic relation, who in turn becomes the first term (Representament or sign) for the subsequent triadic relation (as presented in (Savan, 1986)). In (de)construction signification takes place by a perpetual, circular, recursive, and continuous relation of the three holes, which correspond to the three components of a Peircean sign (R, I, O) [Image 5-6]. These are similar to the holes, which form the surface of the Klein, and therefore contribute to sign and meaning production. This process does not require a metaphysical intrusion, where the new Representament is a result of an Interpretant, but is an 'inevitable consequence' of the nature of the paradoxical continuity-discontinuity of the Klein surface. This loss in continuity that the hole produces on the surface, while it is necessary for the 'completeness' of the three-dimensional object, it is also rupturing it and thus, it produces the capacity for anticipating future (de)construction of the other two consequent holes, which also are expected to contribute inasmuch to the paradoxical constitution of the surface (or the signification process).

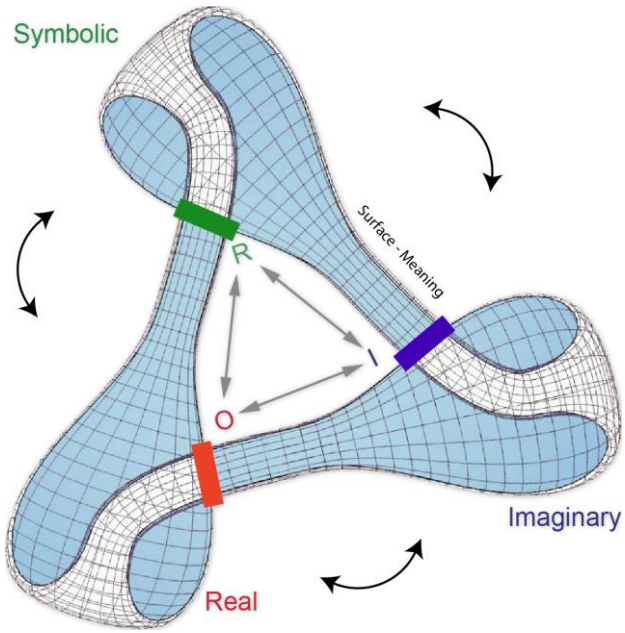

IMAGE 5-6 – (DE)CONSTRUCTIVE SIGNIFICATION (I, R, O – IMAGINARY, SYMBOLIC, REAL)

Restricted by the ontological character of the Klein model, which by its nature provides meaning in a continuum of the relationships of continuity and discontinuity, openness and closeness, we propose that in order to explain the process of

signification we are to analytically focus in each Order separately and at the same time provide their interrelated character.

The metaphor of the Klein for the Imaginary Order offers a way to describe how the 'ego' is constructed in terms of the 'little other', and the relationship with the Symbolic and the Real [Image 5-7]. The 'ego' and the 'little other' refer to the singular character of the duality of meanings that are offered by the 'vessel' of the Kleinian bottle of the Imaginary, and are both defined relatively to a process of 'moving through' the un-symbolised Real and the meanings that are produced in the Symbolic. This corresponds to the process of the 'mirror-stage' of development. The Symbolic Order, following the metaphor of a Klein bottle, refers to a way that describes how the 'barred Other' (𝔸) relates to the 'barred subject' (𝕊). These two are defined relatively to a process of moving through the un-symbolised Real and the 'phantasmatic' status of the Imaginary; the first connection underlines both the effect of language on the relation of the 'barred subject' 𝕊 and the 'unbarred subject' S of the Real, and the missing signifier S(𝔸) that denotes the inherent 'lack' in the relationship between the 'barred Other' 𝔸 and the 'absolute Other' A of the Real. The second connection underlies the transference of the unconscious to the 'barred subject' 𝕊 and the inherent restriction in passing through the imaginary relation (a ⇔ á) that is given by the Klein of the Imaginary Order.

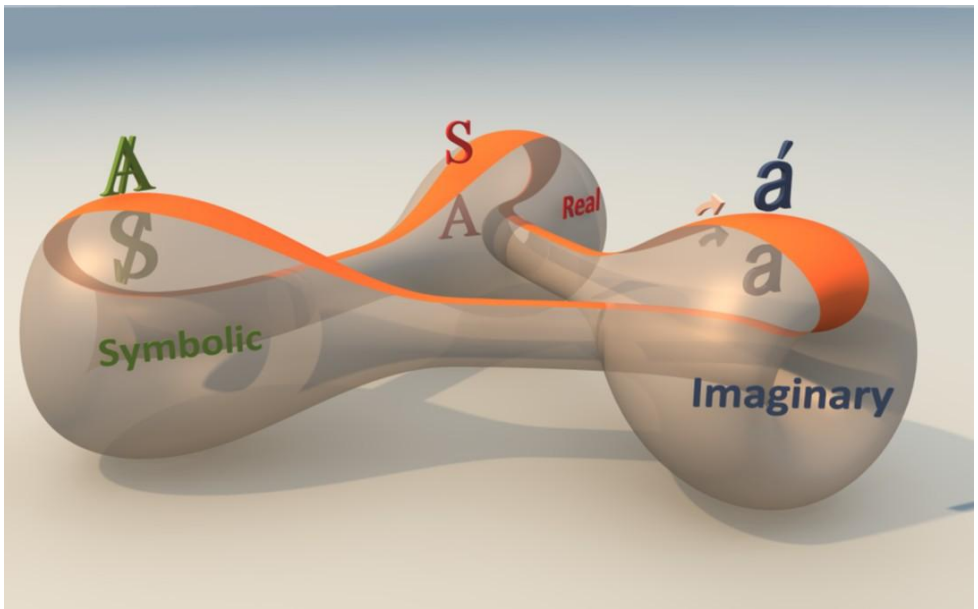

IMAGE 5-7 – MEANING MAKING IN THE IMAGINARY, SYMBOLIC, REAL (TRIPLE KLEIN REPRESENTATION)

This dynamic network of interactions of the three Orders, represented through the tripartite Klein model, provides the way that meaning is dynamically constructed on a non-stratified ontological framework that does not separate semiosis in higher and lower levels. This model that represents the relationship of a subject with the

'personal world' of the (in)dividual, its social world or the (con)text and the ontic nature of the Real, provides the grounds for meaning creation and at the same time constructs each of the individual Orders. If this model is applied to many individuals in a (con)text, it can provide the means for social interaction, communication, collaboration, and other participatory processes that might emerge in social settings.

If we apply the same (de)constructive ontological framework, for the creation of meaning, to itself, then we are to realise that the framework appears in its absence. This means that it appears temporarily to represent and then ceases existence, because it has to split in the quasi-representation of construction and deconstruction. We emphasize that the meaning production, the processes, and the framework for its creation, described in this section, are not the result of an idealistic use of the (de)constructive framework, primarily because meaning in itself it is not be considered as an object, but as an emergent property of the interactions of the network.

5.3.6 Summary

If modernism is desperate to revive the unfinished project of the Enlightenment, then Habermas makes one of the most desperate attempts to do so. This happens primarily because critical theorists still advocate the outdated critical stance against the absolute rationality of the supreme subject. In this thesis we support that this modernist paradigm of the anticipation of a knowledge about objects, should be replaced by the (de)constructive paradigm of (con)textual interactions among (in)dividuals, who have the capacity to negotiate their knowledge/power relations or influences within the 'limits' of an ever expanding network. (de)construction is a detached from logocentrism form of knowledge, mainly, based on the dynamics of practical engagement through an ontological model of signification. It attempts to become free from the quest for the acquirement of a pure ontological reality of knowledge, which focuses on object-subject dichotomy and therefore, it attempts the redefinition of material properties in terms of a (con)textual process of interaction. This is not a form of Kantian correlationism, but rather a type of relational materiality at an ontological level, where interaction as a networking process provides the means for relational concreteness. Even further, if, in philosophical naturalism, Whitehead's ontological principle asserts that everything that happens is a consequence of the reality of specific entities, then our position, by following Actant-network theory's opposing formula, is that: 'all entities have consequences' and therefore we should engage in a practical and methodological interaction with the variety of situations that emerge in our horizon. It is our responsibility as (in)dividuals in the (con)text of knowledge production, to collaboratively attempt to introduce new (in)dividuals in the (con)text networking processes and thus confluently mobilise them to contribute to the (con)text's further development and reversely to achieve their self-development.

5.4 Chapter Summary

Part of what makes aspects of a meta-hermeneutic, (de)constructive ontological framework interesting is its potential to bridge the conspicuous philosophical disparities that have been virtually impenetrable for the last century. As we have seen, this interruption between analytic and continental philosophy can be decreased by a rereading of idealism and materialism through a 'non-philosophical[141]' thinking that is no longer bound to respect the 'infinite interpretability' of (con)texts and thus, provides a novel re-understanding of continental philosophy and the oppositional argumentation of the analytic side. This overcomes the immediate barriers which trouble the reconciliation of the analytic and continental supporters, and thus diminishes the difficulties of scientific reasoning to enter the continental discourse. The respect that we have for science also facilitates this reestablishment, while hopefully giving pause to the polemics of the analytic camp who dogmatically reduce philosophy as secondary to science and practical reason. Therefore, continental and analytic philosophy and science need not to be conceived as mutually exclusive interpretations of an ever escaping real world, but rather mutually conditioning forces that aim at understanding, explaining and most importantly creating the different facets of reality.

In this section we provided a philosophical framework that we believe is useful in helping communication and collaboration researchers and practitioners to understand and develop a (con)textual, systemic (a)teleological, theorising/understanding of knowledge and reality formation. As we will try to demonstrate in the following chapter, this philosophical apparatus has the potential to amplify the need, and thus, provide the grounds to further explore the theory and practice for the development of a pluralistic framework of mixing multiple systemic and non-systemic methodologies from various epistemological paradigms, and thus inform the interactive processes that take place within a (con)text of design.

[141] Non-philosophy in Laruelle's conception (Laruelle, 1998).

Part 2

Design: Creativity, Communication, Cooperation and Collaboration

6 Creativity and Design

In this section we will analyse the relationship between the notions of creativity and design as presented in various scientific, philosophical, and practical contexts. Our purpose is to present the various approaches in defining these terms, and therefore relate them to an a-teleological understanding of a perpetual process of contextual interaction, communication, and collaboration. Hence, creativity and design are considered as processes of a systemic participation, where human beings and artefacts co-evolve.

6.1 Creativity

Creativity, as any other phenomenon, is conceptually distinguished with observation, and its meaning emerges within an interdisciplinary network of philosophical, theoretical, and practical domains.

Most authors of creativity research endorse the idea that creativity involves the creation not only of *original* or *novel* products or ideas, but also of artefacts and concepts that demonstrate some form of utility within the limits of a context; i.e., a creative artefact is an artefact that people consider it significant (Lumsden, 1999, chap. 8), or a product/concept that is either *appropriate* for the situation in which it occurs (Martindale, 1999, chap. 7) (Lubart, 1999, chap. 17), or *valuable* according to some external criteria (Gruber, 1992) (Boden, 1996b, 2003). Moreover, (Feist in Sternberg, 1998, chap. 14) adhere to the "creative idea" the property of adaptation; in explain, a solution is creative if it is both novel and adaptive on the basis of a certain problem. These resemble a utilitarian idea of creativity.

An important question that arises in the research field of creativity is whether creativity is a property of products, people or processes. This differentiation primarily happens because of the inherent logocentrism towards identifying creativity as a 'property of' or as a 'process within'. In the first case, research focuses on the analysis of case studies or computer simulations, where creative production can be observed (Gruber, 1992) (Boden, 1996a). Authors confronting creativity as a people's property, highlight the differences that exist in the variety of forms that creativity appears (Plucker and Renzulli in Sternberg, 1998, chap. 3), or to the characteristics of creative people (Simonton, Feist, Policastro Sternberg, 1998, chap. 6, 14, 11). Analysis of creativity as a cognitive process studies the steps involved in creative thinking (Runco, Ward in Sternberg, 1998, chap. 4, 10), or in teaching creative cognitive processing (Nickerson in Sternberg, 1998, chap. 20).

Another issue concerning creativity research involves the domain in which a creative idea is generated. Independently of whether creativity is a property of people, products or processes, research studies that focus on psychometric approaches advance the concept of creativity to a general skill or characteristic that all creative individuals should have independently to the situation at hand (Plucker and Renzulli in Sternberg, 1998, chap. 3). This domain-general metaphysical understanding of creativity contradicts with the domain-

specific view (Gruber, Policastro, Weisberg in Sternberg, 1998, chap. 5, 11, 12), which affirms the existence of different kinds of creativity ability enhancing in different domains.

6.1.1 Approaches of Creativity Research

The most common creativity research approaches are the psychometric, the experimental, the biographical, the biological, the computational, and the contextual. These six approaches encompass 18 different research methodologies and focus on the following three research paradigms: describing the nature of creativity, comparing creativity and non-creativity, and investigating the factors that affect creativity (Mayer in Sternberg, 1998, chap. 22).

Psychometric approaches describe creativity as a quantitative mental trait, i.e., a measurable human factor or characteristic. Thus, these approaches are mainly focused on the development of instruments to measure the creative ability of individuals. The major characteristics of these approaches can be summarised in terms of: quantitative measurement, controlled environments and ability-based analyses. Psychometric measures of creativity are founded on the *divergence-thinking tests* of Guilford (Guilford, 1967), which were later refined by (Torrance, Ball, & Safter, 1990). Divergence-thinking tests are based on the ability of a person to come up with more than one novel solution to a 'problem', instead of providing one single 'correct' (or common) answer. According to these tests, the creative ability of an individual is evaluated on the basis of his/her original and fluent responses, always in relation to the flexibility and inventiveness they exhibited within an evolving situation. Psychometric approaches endorse the idea that creative individuals display unique personality traits or characteristics that are different when compared to those who exhibit non-creative behaviour. These approaches are mainly based on the relation of creativity measure with other measures (i.e., measures that describe other personality traits) (Sternberg, Plucker, Feist in Sternberg, 1998, chap. 13, 3, 14). The conclusions of these research approaches derive by a method that compares the (characteristics of) individuals who scored high and those who scored low. The creativity obtained results are comparatively analysed with respect to scores on other tests concerning the personality and characteristics of the participating individuals (e.g., a test measuring the intelligence of the participants) and seek for an intercourse between the relating measures. Although, psychometric research methods are well-developed quantitative approaches, some critics argue that such approaches are highly focused on a specific task and consequently restrict a holistic understanding of human creativity that cannot and should not be constrained (Plucker and Renzulli in Sternberg, 1998, chap. 3).

Experimental approaches consider creativity as a cognitive process and focus on understanding and analysing the cognitive functioning 'mental mechanisms' of individuals who solve creativity problems. The major characteristics of these approaches are: controlled environments, quantitative measurement and cognitive tasks analysis. Early experimental studies of creativity are grounded on the nature of insight, which, according

to the classic Gestalt psychology, includes the reformulation of a problem in a more productive way (Sternberg & J. E. Davidson, 1996) (Mayer, 1996). Thus, experimental approaches are based on cognitive task analysis to describe creativity and in particular aim to specify the phases of creative thinking, i.e., the cognitive sub-processes a creative being follows in order to solve a problem. In a similar fashion to psychometric approaches, experimental approaches also analyse creativity versus non-creativity, but mainly concentrate on the cognitive processes involved in creative versus non-creative thinking (Metcalfe, 1986). Another issue concerning experimental approaches is related to the factors that contribute to, affect or inhibit creative thinking. In particular, researchers evaluate creative-solving performance against the effects of creative-thinking strategies, brainstorming, and intrinsic or extrinsic motivations. The controlled environments, in which experimental research takes place, direct to safe conclusions of how people solve a specified creativity problem, while, at the same time, reduce the complexity that surrounds creativity. Many authors consider experimental approaches as weak, primarily because outcomes lack of external validity and does not correspond to real creativity problems (Runco and Sakamoto in Sternberg, 1998, chap. 4).

Biographical approaches study creativity on the basis of creative episodes and life events of creative individuals. In particular, they examine the life of individuals that their creative ability is unquestionable. Therefore, these approaches seek to identify common features that exist in the individual biographical histories (Simonton in Sternberg, 1998, chap. 6). In opposition to psychometric and experimental approaches, the underlying research environment is the actual environment in which creative-thinking occurs. Biographical approaches, in contrast to quantitative-based approaches, emphasise on qualitative descriptions of creative episodes, including detailed analysis and narrative descriptions of creativity research cases (Gardner, 1994). In opposition to psychometric approaches, (Wallace & Gruber, 1992) argue that the description of creativity “cannot be reduced to a fixed set of dimensions”, and thus individual’s creativity cannot be identified on singular creative episodes. They support that an archaeological account towards analysing biographical information is more informative for the creative behaviour of an individual. Quantitative measurements, in biographical approaches, are only employed to produce a general law and statistical relationships concerning common events and characteristics in the history of creative people that form a particular case study. These quantitative measures are used to compare creative and non-creative persons and to explore life events and prerequisite characteristics that foster or enhance the development of a creative person. Authentic environments and the history-based research and documentation of creative personalities provide a more detailed and general description of creativity. However, followers of biographical methods undermine the validity of psychometric and experimental approaches, and focus in solving the problem of control and representativeness in their case studies. This main problem of biographical approaches resides on their inability to provide a complete theoretical model of creativity, primarily because they are based on a bottom-up scientific investigation. When combined with other fields of creativity investigation, biographical approaches offer a useful device for research.

Biological (or cognitive neuroscience) approaches consider creativity a measurable physiological trait that demonstrates itself during the process of creative-thinking. Biological approaches endorse the idea that creative people exhibit special brain activities/changes, when they participate in the solution of a creative problem. Thus, such approaches try to describe creativity through the physiological correlates involved in creative problems, and in particular to the brain activities, such as cortical activation, brain glucose metabolic rate or frontal-lobe and right/left hemisphere activation, of people engaged in creative thinking (Martindale, 1999, chap. 7). Biological approaches provide converging evidence concerning creativity issues, based on scientific methods and measurements (biology, neuroscience, chemistry), which cannot be obtained by other creativity studies, and thus offer additional knowledge to methods based on empirical analysis. On the other hand, such approaches are not able to constitute a complete theory of creativity, since a cognitive activity, such as the creative process, cannot be entirely described as a physiological activity, but it is often considered an emergent property of biological and cognitive functioning.

Computational approaches are computer-oriented approaches that consider creativity as an artificially defined mental computation. Methodologies of this approach use artificial intelligence techniques to produce computer algorithms that simulate creative thinking. Researchers in this field focus on producing such computational models that first create connections between different ideas ("combinatorial creativity models") and then search and manipulate the constructed structured conceptual space ("exploratory-transformational creativity models"). In particular, those models are created for simulating the thinking processes of both creative and non-creative people, in order for creativity and non-creativity issues to be analysed and compared (Boden, 1996a, 2003). Computational approaches cannot be seen as stand-alone creativity investigation methods, primarily because they are based on the assumption that cognition can be reduced to algorithmic models. Evidently, this assumption ignores the non-cognitive factors that are involved in creative problem solving. On the other hand, such approaches provide a precise and objective evaluation tool for other creativity theories, and offer to them the advantage to assess their findings by the use of computer simulations.

Contextual approaches study creativity as a context-based activity inseparable from the social, cultural, or evolutionary context that creative thinking takes place. These approaches move beyond the aforementioned biographical studies of creativity, which only focus on the case histories of creative individuals (Rathunde in Runco & Pritzker, 1999, p. 605). (Csikszentmihalyi, 1991) affirms that creativity is a system model that combines culture, society and the individual, and by doing so he asserts that a creative episode cannot be seen only as a psychological event. According to this systemic model, creativity occurs when an individual manages to produce a novel variation in the cultural context he/she interacts with, which then is adopted by a related society, as a part of a corresponding cultural context. Another issue that concerns contextual approaches is

related to the factors that affect creative thinking. In particular, such approaches try to identify either the barriers of creative evolution in a social context (Williams and Yang in Sternberg, 1998, chap. 19), or the evolutionary processes that shape human creativity, especially when the latter is viewed as a domain-specific process (Lumsden, 1999, chap. 8)(Baer in Runco & Pritzker, 1999, p. 591). Contextual approaches study creativity in a broader way compared to other creativity approaches that do not consider the social and the cultural influence as important in creative problem solving. One basic drawback of these approaches is the fact that the evolutionary studies of creative episodes cannot be established on the basis of solid empirical evidence and thus, provide testable theories of creativity.

Although creativity research has provided an informative domain of understanding creativity, there are still many unanswered issues concerning creative thinking and creative practice in general. Most of the aforementioned approaches are either speculative, and thus, the generalised conclusions about creativity that they provide are not highly supported by the research evidence and the related empirical data, therefore producing theories that cannot yield testable predictions, or are highly practical and systematic and thus, miss the emergent character of creativity.

6.1.2 (de)constructive Creativity and (A)teleology

To this day, the uni-disciplinary approaches tend to view part of the whole as the whole and, at the same time, have a partial, logocentric explanation of the phenomenon they seek to explain, thus marginalising ideas from different disciplines that do not subscribe to the particular account. Nowadays, it seems more obvious than ever that the case of understanding the concept of creativity requires a holistic approach that is able to provide answers that are ontologically validated either in every day practice or at a theoretical level.

A general ontological framework of creativity is required in order to bridge the diversity of approaches, developed in the previous works, and produce a better understanding of the concept. As a phenomenon that emerges within a (con)text, this ontological framework has to include and disambiguate the organisational levels used in the previous approaches and advance their applications in a diversity of new uses within a problem content situation. The approach in analysing the phenomenon of creativity, within an interactive (con)text, is strongly dependent in including the observer to the subject matter in question, but not locating conception if creativity to him/her/it per se. This major advance in scientific practice elucidates that creativity is the result of an interactive activity that is being evaluated within the context of a differentiated environment and not in respect to the person that is doing the creating/observing alone.

The (de)constructive paradigm represents a theoretical and ontological basis of signification for the mental, the social and the physical, conceptions of creativity, upon which a transdisciplinary framework for ‘creativity understanding’ can be formed. In the course of this treatment a thorough analysis of the basic assumptions and influences in

(con)textual understanding of creativity will be presented and adopted. Important for the accomplishment of the aspiration in developing such a theoretical framework of creativity is to identify the levels of organisation,

Therefore creativity is an event-in-process that is to be considered:

- As dependent on the context but at the same time independent to the properties of the (con)text,
- As an emergent property of a network of interactions within a context,
- Independent from any individual creator, but also related to the observer without being ascribed to him/her,
- As a process rather than an event,
- As an a-causal event-in-process,
- As an ateleological process compared to an oppressive finite procedural activity,
- As an emergent property that translates the context and is reversely defined by the dynamics of the context,
- As an anticipatory event-in-process that empowers/mobilises the current state of the context.
- As an event-in-process that 'orients' (does not cause or determine) the processes of interaction and translation of the (con)text.

6.2 Design

Following the humanist tradition, designing is considered a natural human ability evident in many everyday activities of people, such as the design of a room, the outlook appearance, the time-schedules, the design of holidays or meetings etc.. These projects are 'design-like' tasks and their characteristics resemble to the professional design activities, proving that everyone is capable of designing (Cross, 2006).

Evidently, this understanding of design is incomplete, while defining design is still remaining an open-problem; like all words and concepts, 'design' gains its specific meaning and value not only because of what it refers to, but also via its contrast with other, neighbouring terms such as art, craft, engineering, 'media' etc.. This is one reason why definitions of design which purport to encapsulate an essential meaning tend to be so unsatisfactory. Moreover, the word 'design' causes ambiguities because it has more than one common meaning; 'design' is both a noun and a verb and it can refer to the design process (i.e., the act of practice and designing) and the result of that process/method (e.g., a design sketch, plan or model), to the products manufactured with the aid of design, i.e., the designed artefacts, or to the look of the overall pattern of a product (Lawson, 1998).

Another reason why definitions of design are inadequate and provisional is that language is subject to historical change. The term 'design' has altered its meaning through time, determined mainly by the design world (e.g., design domain- professionals, critics,

historians, museum curators, clients, institutions etc.). Thus, any comprehensive history of design ought to follow the historical evolution of the concept 'design', which, in turn, explains the differentiation of design from 'art' and 'craft' and the subsequent development of it in relation to the changing status of the latter concepts. The significant evolution of 'design' mainly relies on the transition from a feudal to a capitalist mode of production and the growth of industry, engineering, technology, mass production, and mass media and communication (Walker & Attfield, 1990).

More precisely, during the Renaissance period a '*disegno*' (i.e., a word that means 'drawing') was considered by art theorists, such as Vasari, to be the basis of all visual arts, which were often referred as 'the arts of design'. At that time *disegno* described the inventive, conceptualizing phase, which generally preceded the making of paintings, sculptures and so forth. All artists engaged in design as part of their creative activities, hence design was not yet considered the exclusive concern of a full-time professional. Design as a profession has its roots in 'art' and 'crafts' traditions and emerged as a result of the growing specialisation of functions, which occurred in Europe and United States as part of the industrial revolution of the 18^{th}-19^{th} centuries. At that time, design became a full-time activity undertaken by trained specialists employed or commissioned by manufacturers. During that period, design of a product was heavily based on the forms, shapes and materials of pre-existing objects. During the 1980s, when design was promoted as the solution to Britain's industrial decline, the words 'design' and 'designer' took on a new resonance and became values in their own right. At this time, an emphasis was placed on the names of particular designers, following the habit of the 'fine arts' field, where the signature of the artist is a guarantee of uniqueness, authenticity, individuality and creativity. In the end, it became more important for the evaluation of a designed product the designer's label rather than the product itself. Nowadays, 'design' is a word which occurs in many contexts: product design, graphic design, software design, fashion design, interior design, engineering design, architectural design, industrial design, corporate design, science of design (Walker & Attfield, 1990).

Among contemporary design historians the dominant definition of *design* or *Industrial Design* is the modern one, which considers design as a specialist activity associated with the industrial revolution, mass production manufacture, the modern movement in architecture, and the consumer society. This definition excludes other design activities occurring outside the industrial context by non-specialists (Latour, 2008). On the other hand, according to (Jonas, 2007), the term 'design' is not subservient to specialists of a specific context, but refers to the exploration and creation of a new meaning through design research and design practice, a cybernetic logic of creating artefacts. The functional and representational aspects of a produced artefact are evaluated in the associated contexts of use, i.e., the human, social and natural context this artefact is employed; a fact that proves the conception of the design as a socio-cultural and socio-technical phenomenon (Simon, 1996)(Latour, 2008).

Although there are attempts to provide a general, comprehensive definition of the term 'design', it becomes obvious that its meaning is subjacent to the different disciplines it emerges from. In particular, the concept of design in the engineering domain is described by (Matchett, 1968) as "*the optimum solution to the sum of the true needs of a particular set of circumstances*". Such a definition does not effectively reflects design in all domains; while an 'optimum solution' can be measured in mechanical engineering on the basis of quantitative criteria evaluating the success of a product, this is not the case of other domains where a designed product is assessed in a more complex or qualitative manner. In addition, in most design problems it is infeasible for the designers to be aware of all the 'true needs' that arise (or will arise) for a particular circumstance. According to (J. C. Jones, 1992), design is "*to initiate change in man-made things*". Although many designers may agree that this statement actually describes the nature of their work, (Lawson, 1998) believes that it is "*too general and abstract to be useful in helping us to understand design*" and conclusively casts doubts on whether it is feasible or/and in fact necessary to obtain a single, comprehensive description of a complex process such as design. On the contrary, searching for such a definition is more valuable to understanding design, a fact that allows for new definitions to emerge and also establishes the importance of the design process in design.

6.2.1 Design Thinking

According to the philosophy of design, a designer is not only an individual that is experienced of '*what to do*' in order to satisfy all the essential characteristics for adequately solving design problems. An important and valuable advantage of a designer is also to '*understand how to design*'; that is to have an '*insight*' about design, or otherwise to develop a '*design thinking*' (Galle, 2002). Obviously, this is not a purely intentional action but a mixture of subjective, social, and physical aspects.

Design thinking considered as a mental process, is related to the understanding of design problems and the associative solution(s); a 'reasoning' concerning all the endeavours towards the fulfilment of an end purpose. (Lawson, 1998) resembles design thinking with "*the sort of thinking we do when we are trying to think where we left something*". Thus, design thinking involves perception and classification of the, engaged to a specific problem, relations, circumstances, principals, and conceptions (Groot, 1965). Understanding of the mental processes, which emerge during design, engenders valuable knowledge that enables designers to deal with the '*functional*' or '*intentional*' part of the design artefact, and at the same time, to improve their designing skills. Design thinking also qualifies designers with a critical view towards their work, offering an important conceptual device to evolve the quality of the produced artefacts (Galle, 2002)(Lawson, 1998). Thus, design thinking metamorphoses designers from executors of a design methodology, who only use the pre-existing knowledge for creating design artefacts, to creative researchers of their own design problems, who self-reflexively operate upon their knowledge and anticipate

new design outcomes, including the conceptualisation of design methods, techniques, and tools.

Design thinking is highly associated to '*design research*', whose objective is to study the activities made by (in)dividuals, in a (con)text, in order to create an artefact (in the broader sense of any artificially created entity), or translate the dynamics of the (con)text itself. A design researcher is not the one who performs a design activity, but the one who also observes and investigates the activity of design (it must be noted, though, that a designer and a design researcher can be the same person). In particular, design research investigates the intentions, the significance, the meaning and the relations of design and design products within a human, cultural, and technological milieu (Bayazit, 2004).

According to Cross (Cross, 2006) and (Bayazit, 2004), design research discipline can be classified into the following three categories, which address the different levels of a design activity:

- *The epistemology of design*: This level of design activity concerns the embodiment of configurations and the knowledge related to design, emphasising the relation of design activity with design thinking.
- *Design practice*: It studies the role of designers in the design process, their performance, their thinking, and how they accomplish their task.
- *Design artefact*: It concerns with the end-product of an intentional design activity and especially analyse the performance of the material substance of products, their appearance and their meaning in the target contexts.

The principles and strategies of design thinking have been changed over the past decades following the historical evolution of the design; a transition from 'modern' to 'post-modern' theories and an analysis of design thinking according to different paradigms portray exactly this evolution (Cross, 1984). A better understanding of design thinking can be achieved through analysis of the thinking process itself. Gestalt psychologists relate thinking to the internal mental representation of the external world, which they call it '*schema*'; that is an 'inner collection of past experiences and knowledge that are used for the interpretation of new events. In an early description, (Wertheimer, 1959) argued that the solution to a problem is an iterative reorganisation of all related to the problem information, until a satisfying solution is obtained. This mental trick of reorganisation served as the basis for various recently proposed design techniques. An effort to measure human's thinking skills with the help of computer programs, has been made by cognitive scientists. Cognitive psychologists recognize thinking as a strategic skill and endorse the idea of a 'functioning mind' that decomposes and recomposes any accumulated information (Lawson, 1998).

6.2.2 Design – an interdisciplinary domain

The progress in technology, the advance in manufacturing equipment, the need for higher quality products, and the continuous growth of universal companies are only some of the

factors associated with the evolution in design domain. Nowadays, design world is becoming more and more demanding, increasing competitiveness in design domain. It seems that design discipline alone is not adequate any more to accomplish the demands of the contemporary era, emphasizing the need of an '*interdisciplinary approach*'. Interdisciplinary approach involves experts or/and concepts of different domains to elaborate together in order to solve a problem (Eppinger, Fine, & K. T. Ulrich, 1990). At present, interdisciplinary approach does not appear as a choice, but more like an obligatory for a productive perception of today's problems. The status of each discipline change, their boundaries become fuzzier, while professional topics are often founded in more than discipline (Skinner, Mckeage, Seymour, Donahue, & Christensen, 1999).

Interdisciplinarity is a word increasingly associated with design. The activity of design is regarded by members of the Design Research Society as interdisciplinary in two respects: it occurs in various arts and industries (e.g., fashion, architecture, engineering, etc.) and it synthesises information derived from a range of disciplines (e.g., ergonomics, sociology, psychology informatics, etc.). In particular, design activity requires knowledge acquired from informatics, engineering, industrial design, manufacturing, ergonomics, psychology, marketing, organisational behaviour among others (Eppinger et al., 1990). Thus, it becomes essential for a designer to be able to collaborate and interact with other participants of a variety of domains in order to organise and understand the concepts and the terms emerge from each discipline; a process that requires communication and teamwork skills in order to mobilise others to interact with his/her own (con)text (Skinner et al., 1999)(Ballay, 1994). Interdisciplinary approach is also related to the externalization of design thinking; such an act enables the exchange of information and knowledge in the early stage of designing where critical decision are taken, and thus facilitates the design process itself (J. C. Jones, 1992).

Design as a profession, 'bounded' under a specific context, occurs in many different specialties, all of which expertise in the creation of a specific kind of artefact; e.g., a product designer creates artefacts of everyday usage, a fashion designer produces the wear – accessories, a graphics designer works on visual representation of ideas via images, and an architect designs the buildings, which an interior designer decorates (Lawson, 1998). Therefore, it becomes obvious that design is an 'open' concept exposed to changes, revisions, or extensions provided by all the different involving disciplines (Walker & Attfield, 1990).

The creative ability of designers to conceive novel ideas and their capacity to apprehend the human and technical dimensions of a design are significant qualifications justifying their valuable position in a network of design interactions. On the other hand, a designer, as any other expert of a discipline, must overcome the narrow margins of a one-discipline focus in order to produce a successful, in many terms, design outcome (Eppinger et al., 1990)(Skinner et al., 1999). The organisational scheme that is produced by the

collaboration of many disciplines, where different methodologies of problem solving are integrated together supplementing the set of genuine undertakings, results to a more comprehensive design solution compared to the one accomplished when each discipline elaborates in its own. This is due to the fact that the produced artefact, analysed from many different views, is more likely to satisfy the general characteristics required from the complex context in which it is employed.

6.2.3 Design and Design Processes

Nowadays, design researchers emphasise more in the processes generating a creative and purposeful artefact rather than in the object itself, making an intellectual shift from aesthetic research to the process models and the user-experience with them (Jonas, 2007). Descriptions of design process, similar to the definitions of design, vary according to the significance each observer attributes to the main components of the design problem.

In an early understanding of the design process, (Reswick, 1965) considers it as a creative activity that results to a novel and at the same time functional artefact. Following this teleological conception of design, (Archer, 1965) argues that a design process is a problem-solving process with a specific target, while (Gregory, 1966) sees the process of design as an activity that forces the end-product to satisfy specific characteristics and properties. (Black, 1995) considers design process as a detailed process generating products (or services) in accordance with the needs of the consumer and the client. He also seeks to describe the end-product by arguing that:

“The outcome of the process is normally a set of detailed instructions that enable the product or service to be supplied regularly in a manner that satisfies both the consumer and the producer.” (Black, 1995)

The subjectivity in the description of a design process is demonstrated in (Lawson, 1998). He provides an example of a structural engineer and a fashion designer in order to demonstrate the divergent thinking of different design domains about the design process. Structural engineers regard as a design process the application of mathematical formulas in order to calculate appropriate values for the construction of a mechanical product, only because this process is different from the process they follow when analysing the characteristics of a specific problem. On the other hand, a fashion designer will argue that a design process involves creation of a new product, and thus it is more creative, inspired and impulsive than the precise and methodical process of engineering. Indeed, an engineer may usually be better informed, than the fashion designer, about the characteristics of the design problem, but research in the area of different design domains proves that all domains deal with both ambiguous and accurate descriptions of the end-product, the design of which will require creative thinking combined with systematic approaches and mechanical calculations (Lawson, 1998).

Thus, one question that rises about design process is to what extend designers in different domains follow similar processes and to what degree these processes vary between

domains or individuals. Designers may agree that in general there are similar design processes and common skills (creativity is associated with any design domain), but there are also design tasks that necessitate the existence of specific skills to be accomplished (i.e., a product designer may need better drawing skills than a mechanical engineer who needs better calculation skills) (Lawson, 1998) (Gregory, 1966).

In an effort to explicate design process, Lawson compared the design-solving strategy with the typical scientific activity. In particular, he performed an experiment by setting the same problem to both postgraduate architectural students and science students. He perceived that scientists systematically studied the problem situation until they determined a fundamental rule that would result to the best solution. On the other hand, the architect students proposed a number of alternative solutions from which they decided upon one to be the appropriate. Lawson commented that both groups realised the nature of the problem, although they employed different strategies, and concluded that the scientists followed a problem-focused approach, while designers adopted a solution-focused approach.

Design researchers, in order to analyse and understand the design process, formalised methodological frameworks and identified to them one common purpose: to *externalize* the design process; that is to underline the importance of design thinking that precedes the construction of an artefact (J. C. Jones, 1992). A main characteristic of design activity, evident in all design strategies, is the generation of multiple satisfactory solutions (which are then evaluated and discarded) instead of the production of just one best solution. This is the reason that (Simon, 1996) describes design process as "*a process of 'satisfying' rather that optimizing*".

The most common description of design process is the consideration of it as 'a three-stage process'. According to this methodological framework, a design process includes three basic stages: the stage of analysis (or divergence), the stage of synthesis (or transformation), and the stage of evaluation (or convergence), which iterate at this order until a solution is obtained. The basic characteristic of each cycle is that each time the outcome of a cycle is more specified that the previous one. It must be clarified, though, that these three stages form more as abstract categories into which the involving activities of design fall into, rather than as basic steps to be followed by a designer (J. C. Jones, 1992).

The stage of analysis or divergence: At this stage the problem is separated into smaller 'pieces' in order for a better understanding of it to be obtained. All relative, to the main problem, elements are maintained. At this stage the objective of the problem is vague and unstable; the client's brief is under consideration in order for a fixed starting point to be achieved.

The stage of synthesis or transformation: This is the stage of creative act that transforms a complex and vague problem into a more specific one. At this stage, designers recognize the significant variables, the constraints, and the characteristics of user-requirements; in other words the patterns that will later converge to a single end-product. The most important part of this stage is the freedom of designers to construct and testify alternative solutions. In summary, this is the stage of 'optimal search' and not of 'optimal solution'.

The stage of evaluation or convergence: This is the stage that the end-product is constructed. At this stage, the alternative solutions become less vague and more detailed and the designers should be able to reduce the number of alternative solutions to a single chosen product. The suggested solution is evaluated according to the objectives acquired at previous stages.

In an effort to analyse the three-stage design process, (Lawson, 1998) compares the above three stages, with the thinking stages of a chess player before he/she decides the next move. According to this paradigm, the chess player first analyses the positions and the relations of all the pieces on the chess board (analysis stage) and then he/she suggests a set of alternative moves each of which reflect different intermediate positions in the game (synthesis stage). At the end, the suggested move is evaluated against the possibility of losing the game.

In contrast to the above methodological framework, (Black, 1995) attempts to describe the steps occurring in the design process. He concedes two iterative phases in the design process:

The problem-finding phase: In this phase a designer identifies all the needs, defines the problem, and recognizes all the requirements and constraints.

The problem solving phase: In this phase the designer generates alternative solutions, evaluated them, create preliminary designs, construct a detailed design and them implement it.

According to (J. C. Jones, 1992) the design methods can be classified into three types that reflect the different views of a designer towards to the design process. The '*black boxes methods*' are the methods that view the design process as a 'black box' [Figure 6-1]. This means that the design process is an irrational mental process that occurs only in the mind of a designer, and which may not always be of his/her conscious control. This view of design process is highly related to creativity; designers are able to create an artefact but they are not able to explain the process they followed to obtain that. The methods of this type are usually developed in order to stimulate creativity, and are based on the appropriate past experiences of the designers for resolving a design problem.

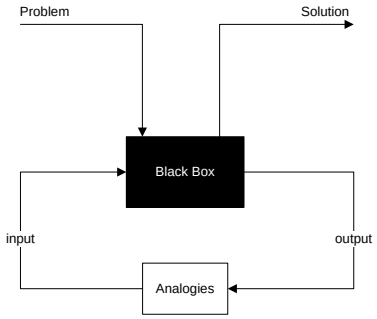

FIGURE 6-1 – DESIGNER AS A 'BLACK BOX'

The second type of design methods is the '*glass boxes methods*', which are based on the externalization of the design thinking. According to this view, the design process is a rational and entirely explicable process, and even though the designers are not always capable of justifying all their decisions, this view regards that a designers' act is constantly intentional. The designer is envisaged as a 'human computer', following iteratively the stages of analysis, synthesis and evaluation, in order to conceptualize the best solution. The third type of design methods is the methods that view the designer as a "*self-organizing system*', capable of controlling the design process. Methods of this type are based on the 'strategic control' of the alternative solutions that are generated through the design process; the designer is able to perform a rational search among the alternatives solutions by incorporating external criteria and proposed strategies. The strategic control mechanism relates the strategies to-be-followed for the solution to the design problem with the design situation, and then predicts and evaluates the results of each strategy according to ultimate objectives.

The advantage of 'black box' and 'glass box' methods is that they manage to extend the solution space of a design problem; the 'black box' methods stimulate the creativity of the designer, while the 'glass box' methods evolve the designer's ideas to a more general set of alternatives. The weakness of these methods is that the designer has to deal with a great amount of information concerning both the requirements of the problem and the corresponding alternative solutions. The fact that the objectives of the problem and the associated external criteria for evaluation are not completely specified, obstruct the decision making process. The designer is not able to use any computer program to search among the various solutions, because there are no dependent criteria of choice compared to the possible alternatives. Thus, the designer either arbitrary selects one of the alternatives to be checked by the computer, or heuristically evaluates each alternative solution. This is the gap that the "self-organizing system" methods strive to overcome by providing a control mechanism that, because it is inherent in the design process, in has the capacity to reflexively evaluate it (J. C. Jones, 1992).

Research in the area of the different design methods has shown that none of the existent methods appear to be adequate to be used on their own. Therefore, there is a tendency to combine methodologies from different paradigms into one single strategy, in order for a systemic solution to be obtained. This process is based on the design team's skills and experiences, and to the requirements of a particular problem, whose combination of methods will serve best the involved design purpose. Contemporary research in the domains of design science and design practice, and in the fields of collaboration and human participation, accepts that there is no possibility for the actualisation of an overarching methodological framework (meta-narrative) that will embody the capacity to answer all the concerns that emerge within a design (problem) situation. Therefore, contemporary design research studies focus on hyper-cyclic design models that are derived from evolution and learning in different domains of knowing, such as second-order cybernetics, contemporary Systems Theory, psychoanalysis, social theories, etc (Jonas, 2007).

6.2.4 What makes design process a difficult task?

(J. C. Jones, 1992) demonstrates an analogy between the design process and a navigator tool of a traveller. He asks the reader to imagine being a traveller desiring to go to a specific place, but the involving landscape he/she must cover is constantly changing according to the assumptions the traveller makes or to the different instructions/information that appear to be followed. It is obvious that, no matter how precise the navigator tool is, such a travelling is a difficult task, and the traveller will need much effort to reach his/her destination.

Designers, similar to the above travellers, deal with vague, ill-defined, and ill-structured problems, not like the usual problems a scientist handles (Rittel & Webber, 1973). Design problems are complex, vague and difficult to be comprehensively stated from the beginning of the design activity; the involving requirements and the related to the design problem information are not entirely available to the designer's first attempts to solve the problem. Indeed, there are aspects of the problem that emerge in the course of the solution process and sometimes the problem itself is possible understood and formulated after the solution has been obtained (J. C. Jones, 1992)(Cross, 2006)(Lawson, 1998). The fact that designers' work depends on the context of interaction (on stakeholders, end-users requirements, circumstances from the natural environment etc.) makes the design activity even harder. Although stakeholders are the ones that usually convey the problem to the designer, they are not always fully cognizant of all the dimensions of the problem; a situation that becomes more complicated when the stakeholder and the end-user is not the same person (Lawson, 1998).

The designer must work with respect to current heuristic information in order to produce a future artefact, whose description must be assumed without knowing all the components of a constantly changing problem. Thus, the final outcome of this anticipatory process is highly associated to a subjective interpretation of the situation problem, the detailed analysis of it, and the decisions that are taken through the design process (J. C. Jones,

1992)(Cross, 2006). The amount of alternative solutions to a multi-dimensional problem such as the design problem (i.e., a design artefact frequently serves more than one purpose) indicates that there are not actually optimal solutions; a search for solutions that satisfy certain prerequisites may direct the designer to neglect other possibly important requirements. Therefore, there are only acceptable solutions to a specific problem, and even more, there might be possible solutions that will never be obtained (Lawson, 1998).

Each alternative solution is evaluated by the participant designers through an interactive design process, in order for the anticipated outcomes (possible solutions) to satisfy all the assumingly related variables. This interactive design and evaluation process is a hard task since there are no established tools to elaborate the selection of a precise and good solution. A design outcome (artefact, idea, method etc.) is usually evaluated and criticised in practice, resulting to a situation where the designers' effort is not appreciated by all groups of people, who might have different preferences. This is an inherent axiomatic situation of any design (con)text and this is what makes design both a difficult and an interesting process.

What makes design process an even more difficult task is that, in contrast to positivist science or mechanistic engineering context, which are directed towards an end, there is not one 'correct answer' or final solution that will completely fulfil a problem situation without having alternatives (probably there will always be a different solution), and thus it is not obvious when the design task is completed. It is subjected to the experience and the judgment of the designer, and the design (con)text, to conclude that no further alterations regarding the providing solutions can be achieved or are necessary and, thus, to decide the completion of the design process. This, of course, does not mean that the same problem cannot inaugurate different design activities in other design (con)texts.

From the above analysis it becomes obvious that the design activity operates upon an unstable and vague 'landscape', where design problems and the corresponding solutions emerge together instead of rationally following each other. Thus, designers can only restrict the area of the design problem and offer suggestions concerning the nature of the possible solution; a solution that is based on the efforts of the designers to synthesise all the associated information in order to provide it and communicate it within a specific (con)text of interaction. In order for the designers to handle the ill-defined design problems, they need to learn how to define, redefine and change the components of the problem in the context of each alternative solution; a difficult task which also forms the most challenging part of design activity. This definition and re-definition of the conceptual tools, the observation of the problem and the problem itself, is to be ontologically described through a perpetual process of (de)construction.

6.2.5 Design (con)texts: Teams and Organisations

What we know today is that the 'objective world' is a contingent network of interactions. We also understand that the only means to participate in this complex system is possible only through quasi-representational modes of communicative interactions. The definition of social organisations and in turn of teams that self-organise in terms of design interaction is closely related to this worldview.

Historically, socio-technical organisations can be described as commonplaces where creative (in)dividual actions take place and, at the same time, 'symbolic areas' are established because of these acts of interactive networking. The observer of these organisations can distinguish, for analytical purposes, that three levels of distinctions can be made. At the first level, *creative act* takes place through transformations of elements of this level. These can be transformations of physical artefacts or conceptual schemas as well as symbolic interactions among the (in)dividuals. At the second level *the creative act is subject to observation* from entities of the same level or external entities to the organisation that have structural relations with the organisation under observation. At the third level the observer as an observer of the observers of the second level makes distinctions. These levels interpenetrate into each other in a way that it is hard to decompose them except for analytical purposes. In reality they compose a network of interactions similar to that described in ANT (Latour, 2007). As such, for simplicity we can accept that the observers of the third level, as well as the observers of the second level, interact within the first level but because its 'boundary-less boundaries' are flexible and are downwardly determined in terms of the interactions of the higher levels it is hard to actually distinguish which level causes what. This is the ontological fusion where social organisations emerge. This three-level categorisation and the inherent problem of absolute distinction (of the levels) informs us that design teams, beyond any observation, are not stratified structures but rather networks or processes of interrelation.

6.3 (de)construction, an interactive process for design

As we have seen in the previous sections, theories inclined to view the world as an 'objective world' and the role of the observer as a catalyst determined to scrutinise its structural and functional properties. Today, the main principle of observation is diverted to a subjective view, where the observer perceives and interprets a world built on his own ideology and subjective ways in approaching the social phenomena. Moreover, the observer apprehends that his own involvement in the system affects the way the system operates; and that because of his observation. The inclusion of the observer in the phenomenon under investigation was a major turnaround in science practice and in turn to the evolution of organisation theories. This view of the world, dependent on the observer, was introduced to social and organisation sciences by the researchers of physical sciences (Heisenberg - Uncertainty Principle) and contradicted to the instrumentalist view (John Dewey) of the previous eras where teleology conducted social organisation to a reality that was predictable and could be determined. Following the end of this 20th century and the early stages of the 21st, an epistemic turn takes place where the correlationist argument of the necessity of the inclusion of the observer is also criticised {see §5.2.6}.

A (de)constructive framework of designerly knowledge production does transform the scientific paradigm of belief in an un-symbolised material Real, the absolute reliance on a subjectivist paradigm, as well as the constructionist and hermeneutic paradigms. A (de)constructive framework for design attempts to embed the aforementioned design paradigms into an updated version of design understanding where knowledge is not subject to an external, metaphysical transformation, but rather is an activity which is becoming possible through the interaction of material, biological, social, and symbolic domains. For (de)construction, design artefacts or 'end-products', design knowledge, design practice, and interactive participation in (con)texts form a dynamic network of action, which is stabilised around the notion of processual activities, like interaction and communication. (de)construction does not attempt to become an overarching genuine design research paradigm, but rather to provide the in-between critical component for identifying logocentrism and combining the merits of other paradigms in design research and practice. Thus, (de)constructive design attempts to identify where previous paradigms fail to provide rigorous answers to contemporary philosophical, practical, and ethical issues of design research, and also aims to provide design researchers with the means to understand the interpenetration of the isolated design epistemologists.

Based on the epistemological paradox, where design, as an evolutionary practice, concerns a future event that is not yet actualised, a (de)constructive framework has to overcome this limitation and provide the necessary means to explain and construct a set of informing guidelines towards an ontological understanding of design processes. Obviously, in the (de)constructive framework the relation between the three processual components of differentiation, translation, and stabilisation is not a causal one. For (de)construction, designing is a process that includes both past, current, and future developments and thus, produces patterns of deterministic chaos, temporal stability, and evolutionary development. This means that the process of (de)constructive design is a synchronic process where all three processual components co-evolve in order to construct a pattern of meanings or a chain of signification, which if seen archaeologically, provide the evolutionally history of the process.

If seen within a (con)text of design, where various (in)dividuals collaboratively participate towards the development of an abstract goal, the (de)constructive design process can be described synchronically in the three Orders of the Imaginary, the Symbolic and the Real. In opposition to attempts who consider design a process that highly depends on the differentiation phase of the design evolutionary process, we support that designing cannot be seen independently from the other two phases of translation and stabilisation. While, (Jonas, 2007) supports that the success of designing depends on the variation phase, while the other of two phases of selection and re-stabilisation are causally coupled, we propose that this is an observational barrier that happens primarily because of the linear understanding of the evolution of the three processual components that have been borrowed by the sociological theory of Luhmann. Based on the non-stratified circular

model of the ‘three-Kleinian surface’ / ‘Lacanian Orders’ continuum, we believe that it is almost impossible to centre the design process to the one of the three Klein surfaces / Orders, primarily because the causal relata of the surface/Order formation does not allow us to visualise and/or understand the process in a linear fashion of steps. The processes of differentiation, translation and stabilisation continually and synchronically occur both for the re-formation of each Order (the re-formation of the hole) and at the same time compose a coherent and concurrent evolutionary process.

For (de)construction design success and creativity is not to be seen as the result of the (in)dividual, nor the result of pure social random activity, not even a consequence of unknown material causes. Design happens at the intersection of these three domains and is always observed historically as a interactive process of (con)textual representation. Therefore, design might produce something new and innovative within the (con)text but at the same time, the process of its interactive development also differentiated, translated and stabilised the network of interaction as well as the (in)dividuals that, in some way, were connected and thus interacted with the process.

7 Interaction, Communication, Cooperation and Collaboration in Design Contexts

In order to make the transition from a philosophical framework to a methodological framework that will support us in understanding interaction and collaboration in design contexts, in this section we explore the key epistemological notions, and methodological approaches which underpin the works of the most important researchers in interaction, communication, cooperation and collaboration.

7.1.1 Communication

In terms of a phenomenological interpretation, communication can be thought as a profoundly rooted activity of organismic behaviour and an intrinsic property of social groups. Therefore, for phenomenology social interaction is impossible to be thought by the absence of communicative actions. Hence, communication is believed to provide the basis for interaction. Collaboration and social interaction is considered to occur through communication between human agents while technological advances in telecommunications, the internet and information systems development appear to have profound effects in mediating communication and collaboration. A definition of communication cannot ignore the purposeful nature of communication and in particular the analysis that is given for the political and discursive character of communication that has been outlined by a number of important theoretical philosophical paradigms, as outlined in the first chapter of this thesis.

In sciences and technology, numerous communication paradigms have been proposed over the years, but each of these is based on slightly different assumptions about, or definitions of, communication. Two of the most influential publications came from the (Lasswell, 1948) and (Shannon & W. Weaver, 1949). According to Lasswell communication is defined relatively to: who, says what, in which channel, to whom, with what effect, while Shannon and Weaver produced a model of communication that although were principally concerned with communication technology, has become frequently used in describing communication in general – including communication in artificially constructed systems [Figure 7-1].

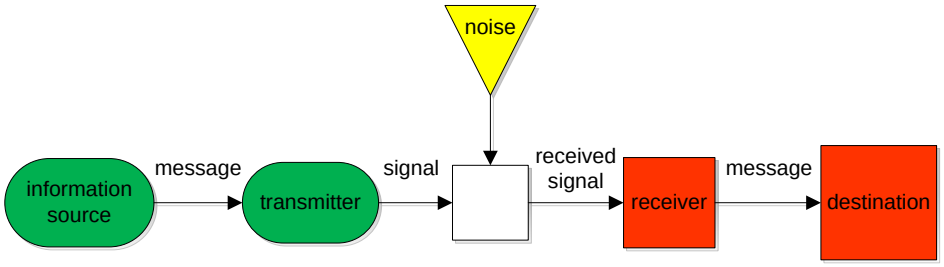

FIGURE 7-1 - SHANNON ET AL. COMMUNICATION

Previous approaches in defining communication are considered as "the command and control paradigm" or "simple linear models", where communication is thought possible when there is exchange of information/data between a sender and a receiver via a medium (McQuail, 1975) . Formally, this happens when the sender is informed that the receiver has received the message. According to Mumby "*such a representational model is unable to conceive of the possibility that communication is anything other than an empty conduit for effectively communication an already existing set of conditions…The act of communication and the world about which one is communicating remain firmly separated*" (Mumby, 1997). If we observe these mechanistic and linear explanations of communication from philosophical perspectives and according to Romantic Humanism and the Social Contract Theorists, then we can argue that there can be an ideal form of communication in an ideal form of community[142]. There is always a connection between the size of a community, its capacity for harmony and the forms of communication possible within it. Rousseau argued that communication is transparent and much easier in small communities where the proximity -instantaneity and physical contact of the participants makes possible the arrival of agreement (Rousseau, 1968, 2002). This preoccupation with a metaphysically transparent understanding of communication restricts communicative action to a less important activity and thus avoids the immanent responsibility that any system must exhibit in order to maintain its communicative behaviour. In his analysis (Starobinski, 1988) characteristically argues that Rousseau and the humanists avoid this responsibility by endorsing in a perfectly transparent, teleologicaly genuine communication.

On the other hand the interpretivist approach to communication (or pragmatic approach) place subject and object in a productive dialectical tension. Communication in this collaborative paradigm entails the mutual understanding of the meaning of messages that have been exchanged among participants during the course of a communicative act/event.

[142] Social contract theorists speak for a purposeful communicative activity that entails the ways in which people form states and/or maintain social order. The notion of the social contract implies that the participants in such an activity constitute normative structures or authority (e.g. government) in order to receive or maintain social order.

These models recognise the importance of context and social negotiation of meaning, and have been established in explaining the complexities of communication. The only way of obtaining indications about the receiver's possible understanding is by observing his/her actions and reactions, since they are guided by other possible commitments assumed during communication. The receiver reads the message and interprets it, changing his/her commitments and knowledge in a certain way. That will prompt him/her to reflect upon the newly acquired knowledge and react. Thus, sender and receiver move into a continuous discussion where they reflect upon their actions in the specific context of interaction that has been set up. As we have already seen, this point of view is related to the early Habermasian argument that any attempt to communicate or act is a use of language that presupposes a horizon of meanings shared with other participants (Habermas, 1979).

Although the interpretivist approach to communication is focusing in the analysis of the participatory construction of a meaningful world through communicative practices, the critical project and the theorists of Frankfurt school (Adorno & Horkheimer, 1988) are characterised by an articulation of hermeneutical suspicion. In his late writings Habermas argues that the acknowledgement of the possibility of success lies within communicative failures through the implicit recognition of shared criteria constitutive of our communicative practices. By following a pragmatic tradition, he speaks of "universal and unconstrained consensus"; the possibility of an ideal speech situation of collective comprehension (Habermas, 1984, 1989). This is a kind of mutual pre-understanding of the criteria for successful understanding, shared by human beings even in contexts of misunderstanding, and it describes a social constructionist view of the world but criticise the interpretivist inability "to explore issues of power and ideology and the processes through which certain realities are privileged over others". In a similar sense, Schirato and Yell propose a general definition of communication. They simply define communication as "the practice of producing and negotiating meanings; a practice which always takes place under specific social, cultural, and political conditions" (Schirato & Yell, 2000).

By contrast, postmodern thinkers disagree with those who adopt ideals of community based on an ideal form of communication, and support the idea that any successful communication contains the alternative possibility of its own failure. This very possibility of failure is, for the postmodernists, the condition of any communicative event; it makes communication possible. This failure of communication, embedded in communication, calls for the recognition that we might not fully share criteria for success, or might make a mistake about what is shared. Contrary to Habermas who supports the idea that mutual understanding is implied in day to day language and actions, Derrida argues that this ideal is impossible (Derrida, 2001). The misunderstanding is integral in communication and action; participants in a communicative event are in a state of continuous *aporia* between successful and not successful communications. This idea of a continuous flux in meaning creation is based on "speech acts" that take place in relation to what does not 'belong' to

'speech acts". Every context of communication is enfolded by another context, so that the context is never stable, without a definitive fixing of its meaning.

In the case of communication in design teams the characteristics of the context are in a continuous negotiation and are thought to be provided by the actors themselves ((in)dividuals), the situation governing the status of the actors' (social) behaviour including the medium/vehicle of communication (semiotic device, technology etc.), the cultural environment that might be applicable including technological status, etc.. All these comprise the (con)text of communication, and therefore, communication is a process that takes place in a network of differentiated and deferred hypothetical structures.

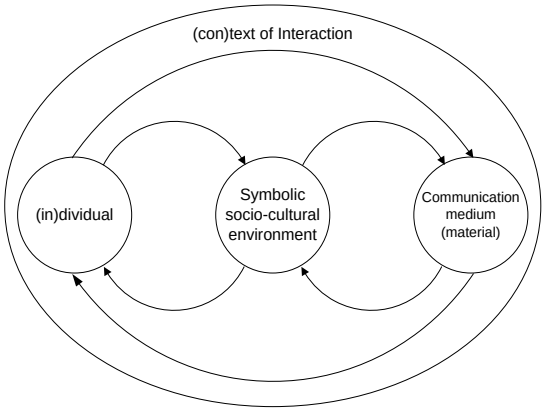

FIGURE 7-2 - SYSTEM OF INTERACTION IN THE COMMUNICATION DISCOURSE

For the purposes of this thesis we will follow a discussion among the four paradigms mentioned earlier and begin the analysis by the employment of the three ontologically observed characteristics of a system of interaction within the communication discourse [Figure 7-2]: (in)dividuals (participants, actants or agents), symbolic socio-cultural environment (community, organisation, team, norms, rules, etc.) and communication medium (technology: communication and collaboration systems, language).

7.1.2 Distinctions in the terminology of Coordination, Cooperation and Collaboration

The roots of the words coordination, collaboration and cooperation do carry distinctions worth pursuing.

Coordination, in team work, is considered a regulation process; the normal and routine flow of interaction where participants are following their scripted roles. These scripts are thought as parts of product or process design documents and are coded in written rules, plans and schedules or in tacitly assumed traditions and norms (Bardram, 1998). The differentiation processes in organisation contexts, i.e., division of the work between specialists, groups, departments, are coupled by coordination processes to adjust the activities of individuals and groups to common goals. Working definitions of coordination are given by:

- Mattessich: "Coordination is characterized by more formal relationships and understanding of compatible missions. Some planning and division of roles are required, and communication channels are established. Authority still rests with the individual, but there is some increased risk to all participants. Resources are available to participants and rewards are mutually acknowledged."(Mattessich & Monsey, 1992)
- Malone and Crowston: "Coordination is the act of management (interpersonal interaction) of interdependencies between activities performed to achieve a goal"(Malone & Crowston, 1990)
- Schmidt and Bannon: add to Malone's definition "… involving the allocation, planning and integration of the tasks of individual group members."(K. Schmidt & Bannon, 1992)
- Andriessen combined these two characterisations in order to provide a more general definition of coordination that does not only take place in a specific group. "Coordination is the use of mechanisms to manage interdependencies between activities performed to achieve a goal, involving the allocation, planning and integration of tasks of individuals or groups (Andriessen, 2002).

Andriessen's approach of coordination involves the possibility that participants, who work together under the framework of a common goal, do not necessarily share the same ideas and personal goals. Andriessen argues that

> *"…this common goal does not exclude that the individuals involved may also have different goals and/or conflicts. If however there is no commonality whatsoever, coordination is not needed." (Andriessen, 2002)*

Accordingly, the commonality of goals imply interdependency of activities; a notion that is considered central to coordination. This degree of task interdependence refers to the degree to which participants in a design context, rely on each other to carry out their individual responsibilities successfully. This degree of interdependence regulates the degree of coordination; the higher the task interdependence the higher the need for coordination (Andriessen, 2002).

Coordination is considered a central concept in cooperation/collaboration studies and often is used to define them. In this sense Thompson supports the idea that task interdependence is one variable that affects team performance in terms of coordination. Type of interdependence is another (J. D. Thompson, 1967). According to his work three types of interdependence can be identified:

- *Pooled interdependence (discrete roles, no interdependence of tasks, no common goal, externally coordinated)*: in this type, each participant provides a discrete contribution to the design team by collating or pooling its obtained experience

(information and knowledge). No need for direct individual interaction is needed. A typical example of this is a group of individual labourers who produce work and are coordinated by a supervisor responsible for adjusting the contribution of each members output to the task of the group.

- *Sequential interdependence (discrete roles, inter-depended, no common goal, externally coordinated)*: in this type, the product or labour work of a participant is highly dependent upon the output of another. A classic example of this type is the work on an assembly line.
- Mutual or reciprocal interdependence (discrete and specific roles, interdependence, common goal, internal or external coordination): in this type, participants set critical contingencies for each other that have to be determined before taking action. Participants have different but specific roles and interact in a meaningful way for a common goal, e.g., a surgical team. This is often described as a collaborative type of interaction (Bair, 1989).
- *Team or group interdependence (roles are unspecified-emergent, interdependence, common goal, self-coordinated)* defined as a fourth type of interdependence by (Ven, Delbecq, & Koenig, 1976) in order to include the possibility where participants with similar or not discrete roles, jointly cooperate in order to accomplish tasks. In this case the organisation or team self-organises and autonomously defines its course of action. This is a typical example of a design team trying to complete a design goal or project and often is described as a *cooperative* type of interaction (Bair, 1989).

7.1.3 Cooperation and Collaboration

The 'collaboration' versus 'cooperation' debate is more complex compared to the distinction that (Bair, 1989) provided in terms of coordination. Many researchers use these terms interchangeably and one can without doubt identify that there is an obvious disagreement amongst the authors themselves (Dillenbourg, M. Baker, Blaye, & O'Malley, 1996)(Andriessen, 2002).

Cooperation, is often defined as “to work together, act in conjunction and to cooperate for mutual benefit” from the Latin *co operari*, to work with or along side.

According to (Mattessich & Monsey, 1992) the supplementary term of coordination is important for the definitions of cooperation and collaboration. This led him to provide a definition of cooperation as follows:

> *“Cooperation is characterized by informal relationships that exist without a commonly defined mission, structure or effort. Information is shared as needed and authority is retained by each interacting member/group so there is virtually no risk. Resources are separate as are rewards.”*

Collaboration is often defined as “to co-operate, especially in literary, artistic or scientific work”, deriving from the Latin words *col labore*, to work along side one another.

Collaboration similarly to cooperation is often thought of as joint problem solving and the ascribed meaning is “working with others with shared goals for which the team attempts to find solutions that are satisfying to all concerned”.

The important distinction between the two words (cooperation and collaboration) is believed to rely in the creative aspect of working together. Collaboration compared to cooperation is considered to require a higher sense of working together in order to achieve a holistic creative result. It is thought a far more demanding activity, more difficult to establish and sustain, than simply carrying out a project as a team. As (Mattessich & Monsey, 1992) emphasises, collaboration requires a greater commitment to a common goal than co-operation with an attendant increase in risk:

> *“Collaboration connotes a more durable and pervasive relationship. Collaboration is a mutually beneficial and well-defined relationship entered into by two or more participants (human agents or organisations) to achieve common goals.”*

What (Mattessich & Monsey, 1992) describe above as “collaboration” is similar to Bair’s account of cooperative type of interaction in terms of coordination. The distinction of cooperation and collaboration seems to depend on each author’s definition of autonomy and self-organisation. Mattessich’s hypothesis counts on the type of symbiosis among the participants (well defined durable and pervasive relationship, mutual benefit), while Bair supports that self-organisation and autonomy relies on self-coordination. As a result Mattessich defines self-organisation and autonomy as collaboration while Bair by following Van de Ven, defines them as coordination. Finally, according to (Dillenbourg et al., 1996) and contrarily to (Bair, 1989), *collaboration* is distinguished from *cooperation* in that cooperative work

> *“... is accomplished by the division of labour among participants, as an activity where each person is responsible for a portion of the problem solving...",*

whereas collaboration involves the "... mutual engagement of participants in a coordinated effort to solve the problem together."

Here we identify that Dillenbourg agrees with Mattessich and maintains the ideas of “division of labour”, hierarchical division of activities, “mutual engagement” and “common goal” in order to explain collaboration.

The following table [Table 7-1] summarises the key issues given by the variety of authors in order to define cooperation and collaboration:

TABLE 7-1 - COOPERATION/COLLABORATION, AUTHOR SUMMARY

Authors / Cooperation & Collaboration	Bair	Dillenbourg	Andriessen	Mattessich
Cooperation	Unspecified roles Interdependence Common goal Self-organised	Division of work Externally coordinated No common goal	Unspecified roles Interdependence Common goal Self-organised	Informal relations No common goal Self-organisation autonomous
Collaboration	Discrete roles Interdependence Common goals Internal or external coordination	Division of work Internally coordinated Common goal	Discrete roles Interdependence Common goals Internal or external coordination	Formal relations Common goal/mission Autonomous Self-organised

For the pu

For the purposes of this thesis and in acknowledgement of the distinctions that others in the field have made, we provide definitions for the terms *cooperation* and *collaboration* that take into account previous approaches and also expand the meaning of both terms in an attempt to involve the paradigms of modern and postmodern thinking in a dialectical framework of (de)constructive ontology that has been analysed in the previous sections. Following this line we describe both terms in accordance to a broader view of the topics outlined earlier:

1. Type of (in)dividual's roles (specific, discrete, emergent)
2. Type of symbiosis (synergy, relations, association, interdependence, interaction, group characteristics: (size, proximity of members, virtuality), division of labour)
3. Type of teleological purpose (goal, aim, end)
4. Type of management/organisation (coordinated, autonomous, self-organised, indeterminate)
5. Type of environment (passive, competitive)

Accordingly we describe (Stavrakis, Viorres, Koutsabasis, & Darzentas, 2007):

Cooperation is defined as a means to an end that involves gains and losses on the part of each (in)dividual (being a designer or a team). This type of symbiosis is defined in terms of a continuous interaction and interdependence, within a contingent environment. This behaviour can sometimes encourage a competitive environment, and parties need not necessarily to carry a relationship beyond the accomplishment of the task at hand. The goal is considered static and is externally imposed by a manager/coordinator. In cooperation there is not a strong sense of team integrity beyond the goal, but (in)dividuals are aware of the interdependence that emerges because of the common goal that is imposed externally.

Collaboration is defined in terms of autonomy and self-organisation at the team's level. Similarly to cooperation, this type of symbiosis is described in terms of continuous interaction and interdependence, within a contingent environment. It is important that encouragement of competitive environment is considered necessary but its competitiveness is continually redefined in terms of the team's, unstable, coherence and (in)dividual's fragmented nature. There is not an external goal (telos) to be accomplished, but all (in)dividuals are focusing in carrying on interacting with other (in)dividuals in order to secure their own participation in the (con)text and potentially the autonomy of the team, which in turn legalise/support their participation. Moreover, the structural couplings that are produced during the course of the interaction provide the 'unstable' ground for the emergence of temporal goals that need to be accomplished. In this context a sense of interdependence, team integrity and situation awareness is produced. Collaboration is considered here in terms of a (de)constructive ontological framework, as a systemic, autopoietic process where (in)dividuals participating in a (con)text define and are defined within its flexible boundaries.

In the next section we will focus on the ideological means for practising and developing for collaboration. We will review a set of methodologies, methods, and multi-methodological practices for participation and collaboration in design (con)texts.

7.2 Review of Methodologies for Participation and Collaboration in Design Contexts

According to (Mingers & Gill, 1997) "the term methodology means a structured set of guidelines or activities to undertake to improve the effectiveness of an intervention"... "…methodologies are based implicitly or explicitly on particular philosophical assumptions concerning the nature of the organisational world and the appropriateness of various forms of actions. These sets of assumptions form a particular view of the world that is sometimes called paradigm". Methodologies are either constructed intentionally, or emerge out of processes of practical engagement (e.g., planning) when dealing with everyday complex situations.

In the postmodernist camp (Taket & White, 2000) support that *"The will to methodology is a moral obligation to acquire "reliable" knowledge and act to achieve practical ends in some defensible manner, the will to methodology thus implies a will to act."* Thereby they adopt the Nietzschean 'perspectivism' where the external world is to be interpreted through different concepts and alternative systems of beliefs that there is no authoritative independent criterion for determining that one system is more valid than another (Nietzsche, 1996). This necessarily involves the problem of infinite regression (a type of reflexivity) and leads us to the argument that "anything goes"; a "will" which provides different possibilities of different truths (Mingers & A. Gill, 1997). But instead of accepting any methodology, this idea gives access to the formation of two interpretations for transfer to multi-methodology: 1) Multi-methodology as another meta-narrative which serves as another version of "will to methodology" and 2) a strategic action of mix and match, a practice where we seek for guidelines, examples, stories, metaphors etc., for use in our intervention (Taket & White, 2000). In order to provide a comprehensive synopsis of the methodical, methodological and pluralistic/multi-methodological approaches in systems practice it is necessary to endow to a brief analysis of the most important approaches in systems thinking that replaced the old hard paradigm with a new vigorous soft paradigm in systems research[143].

The past, present and future of purposeful communication, participation and collaboration can be initially summarised according to the philosophical and methodological approaches that are considered as dominant when compared to a generic set of methodological rules that critical systems thinkers - Checkland et al., Jackson et al. and Mingers et al. - outlined in their pluralistic, multi-methodological systemic theoretical frameworks (Checkland, 1999; Checkland & Scholes, 1999)(Jackson, 2000, 2003)(Mingers & Brocklesby, 1997; Mingers & A. Gill, 1997). In summary, these methodological rules compose a comprehensive set for the study of systems in organisational research, operational research, management sciences and potentially for information systems. They focus in describing human participation and collaboration in multiagency settings (organisations, teams etc.) and provide a pluralistic framework for the inclusion of, among others, psychological, social, technical and organisational aspects. Consequently we support that these aspects can provide reasonable methodological suggestions for constructing a non-formalised, pluralistic and multi-methodological rationale for understanding contextual interaction, communication and collaboration {see §7.3.2}.

[143] It was observed and proved that the traditional systems paradigm (hard systems) was unable to contend with the inconsistencies that arise when applied in complex circumstances where human-centred organisational and societal situations take place. This has yielded to the introduction of the *soft systems* paradigm, which both preserves the achievements of the hard in its specialised domain of application and extends the area of successful operations of systems ideas to the behavioural and social arena (Jackson, 1992).

The established methodologies for participation and collaboration are holistic in character and use systems ideas in different ways, according to the purposes they anticipate to achieve. Their differences are based on the metaphors they employ and the paradigms they adopt. In short these can be classified in three major categories: purpose based, metaphor based, and according to the sociological paradigm that they embrace into their practice. Therefore, in the sections to follow, we outline a short overview of the most notable methodologies in collaboration, partnership and participation. Following this review, we put together a critical appraisal regarding the current methodological status in collaboration design contexts and accordingly propose a turn to a multi-paradigm multi-methodological thinking.

7.2.1 Purpose-Based Classification

According to Jackson (Jackson, 2000, 2003) participation and collaboration methodologies can be classified into four types, based on the purpose they want to achieve:

Type A. *Approaches for improving goal seeking and viability*: their primary orientation is to improve multiagency working in terms of how well the associated environment does it tasks and responds to changes in it. They achieve their purpose through increasing the "efficiency" and "efficacy" of the internal processes and structures. Methodologies of this category are based on "Hard System Thinking", "Organizational Cybernetics" and "Complexity Theory" (for a compehensive review of these approaches see Jackson, 2003).

Type B.*Approaches for exploring purposes*: their primary orientation is to improve multiagency working by exploring purposes and ensuring sufficient agreement and commitment is obtained about these purposes. They evaluate different aims and objectives and judge the effectiveness and elegance of what is being proposed. Methodologies of this category are "Strategic Assumption Surfacing and Testing" (Mason & Mitroff, 1981), "Interactive Planning" (Ackoff, 1974) and "Soft Systems Methodology" (Checkland & Scholes, 1999).

Type C.*Approaches for ensuring fairness*: their primary concern is to emancipate and empower disadvantaged groups; discrimination of all kinds is eliminated, full and open participation is encouraged, while paying attention to all those affected by their actions. Methodologies of this category are "Critical Systems Heuristics" (W. Ulrich, 1983, 2002) and "Team Syntegrity" (Beer, 1994a).

Type D. *Approaches for promoting diversity*: their primary orientation is to exhibit diversity appropriate to the emerging challenges a multiagency environment has to face. They emphasize exceptions and people's emotions when seeking change and they challenge normality and routine by encouraging difference and fun. This category includes those methodologies that are based on "Postmodern Systems Thinking" (Taket & White, 2000)(Kilduff & Mehra, 1997)(Hassard & Parker, 1993).

The aforementioned approaches are not mutually exclusive; rather, when observed in their wholeness, they offer a reasonable set of guidelines as to where the main emphasis of systems thinking relies. Here we support that in order to improve organisational performance requires an ability to look at a collaborative environment from all these perspectives, while prioritising and emphasising on a frequent shift of different actions at different times.

7.2.2 Metaphor-Based Classification

Another classification mentioned in (Jackson, 2000) is based on the metaphors each methodology for participation and collaboration is associated with. Hard Systems Thinking leads to methodologies that depend on the 'machine metaphor'. The 'flux and transformation' metaphor includes methodologies that are derived by System Dynamics and Complexity Theory. Organizational Cybernetics theories result to methodologies that are built on insights from the 'organism' and 'brain' metaphors. The 'Soft System Methodology', the 'Interactive Planning' and the 'Strategic Assumption Surfacing and Testing' methodologies are soft system approaches that build their foundations on the 'culture' and 'political system' metaphors. 'Critical System Heuristics' and 'Team Syntegrity' are based on the 'psychic prison' and 'instruments of domination' metaphors, while postmodern thinking leads to methodologies that are included in 'carnival' metaphor.

7.2.3 Sociological Paradigm-Based Classification

These philosophical/methodological approaches are influenced by the categorization of sociological and organisational paradigms given by (Burrell & G. Morgan, 1979)(Alvesson & Deetz, 2000), namely: *The functionalist paradigm, the interpretive paradigm, the emancipatory paradigm, the postmodern paradigm*. In more detail and in terms of a systemic approach, these paradigms can be described as follows (are also complemented by a corresponding set of rules):

The Functionalist Paradigm: ensures that everything in a system is functioning well so as to promote efficiency, adaptation and survival. It uses scientific methods and techniques to understand how a system works and how it interacts with its environment. The metaphors that are associated with this paradigm are the 'machine', 'organism', 'brain', and 'flux' and 'transformation'.

According to (Jackson, 2000, 2003) the constitutive rules are:

[6] Its methodology is a structured way of thinking based on the functionalist theoretical rationale. It is clearly following the positivist tradition of Enlightenment.
[7] Systems ideas are the basis for intervention strategy. This paradigm will frequently employ methods, models, tools and techniques that also draw on systems ideas.
[8] The basic claims for the incorporation of a systems methodology is justified according to the following guidelines:

a. the real-world is systemic,
b. systems representations are used to denote the problem situation,
c. the representation models are constructed to portray the situation and provide absolute knowledge about it,
d. models are used to learn how best to improve the real world and for the purposes of design,
e. quantitative analysis is important since systems obey laws,
f. the process of intervention is systematic and is aimed at improving goal seeking and viability,
g. intervention is best conducted on the basis of expert knowledge,
h. solutions are tested primarily in terms of their efficiency and efficacy.
i. The application of the functionalist methodology from different users requires conscious reasoning for its adaptation in complex contexts, where it is differently applied and interpreted.
j. The application of the functionalist methodology affords innovation in terms of the theoretical and the practical. Therefore its outcome is to be aligned with:
k. the theoretical rationale of the methodology,
l. the methodology itself,

m. the methods models tools and techniques that are employed,
n. to the real world situation,
o. all of the above.

In summary, a *Functionalist Methodology* is a structured way of thinking based on the 'Functionalist Paradigm'. Its systematic intervention strategy aims at improving goal seeking and viability and is conducted on the basis of expert knowledge. The basic assumption the methodology of this category makes is that the multiagency environment is systemic and each problematic situation within this environment is handled in systems terms. A model is constructed to capture the nature of a situation and to explore the appropriate improvements associated with each problem. The deriving solutions are primarily tested for their efficiency and efficacy and quantitative analysis, based on the laws a system obeys to, has proven to be a helpful tool. The methodologies that belong in this category are the one deriving from System Dynamics, Organizational Cybernetics and Complexity Theory.

The Interpretive Paradigm: supports that social systems result from people's purposes and the interpretations they make out of a situation in which they are involved. The interpretive paradigm aims to provide understanding of the different meanings people bring to collaborative activity. This paradigm is mainly based on participative involvement, in order to enrich the purposeful activity. The "cultural" and "political system" metaphors are usually associated with this paradigm.

According to (Jackson, 2003) the constitutive rules are:

[1] Based on the interpretive theoretical rationale, an interpretive systems methodology is a structured way of thinking which is focused on cultivating objective and actual problem situations.
[2] Systems thinking as the foundational point for intervening. This core of the interpretive paradigm is to exercise its functioning on other systemic mechanisms akin to methods, models, tools and techniques.
[3] The constitutive rules of the methodology are found on the following guidelines:

a. The actual is not necessarily systemic,
b. The investigation of the problem situation is not be conducted necessarily in systems terms but rather to employ creative practice,
c. The hypothesis that there might be ideal human activity systems in contrast to the problematic situation, must lead the interventionist to provide models that anticipate them,
d. Debate about the intervention and its outcomes are grounded on the use of models that define the value of change,
e. quantitative analysis is not desirable;
f. the process of intervention is systemic and is aimed at exploring purposes, alleviating unease and generating learning;

g. stakeholder participation is considered important in the process of intervention,
h. an axiological mechanism is to be established to evaluate the changes of the intervention.

[4] The application of the interpretivist methodology from different users requires conscious reasoning for its adaptation in complex contexts, where it is differently applied and interpreted.
[5] The application of the interpretivist methodology affords innovation in terms of the theoretical and the practical. Therefore its outcome is to be aligned with:

a. the theoretical rationale of the methodology,
b. the methodology itself,
c. the methods models tools and techniques that are employed,
d. to the real world situation,
e. all of the above.

In summary, a methodology based on the interpretive paradigm is a structured way of thinking. Its systemic intervention strategy aims at exploring purposes, alleviating unease and generating learning and it is conducted on the basis of stakeholder participation. This methodology does not assume that a multiagency environment is systemic and therefore the problematic situations within such an environment are not necessarily to be handled in system terms. On the contrary, the analysis of a problem is designed to be creative; the constructing model represents the 'ideal-type' of human activity systems and is used to counterpoise all these changes that are feasible and desirable. Every change is evaluated primarily in terms of their effectiveness and elegance. "Soft Systems Methodology" is a methodology of this category.

The *Emancipatory Paradigm*: attempts to 'emancipate' oppressed individuals and groups in a multiagency environment. It pays attention to all forms of discrimination and criticises the forms of power and domination in a collaborative environment. This paradigm is associated with the metaphors of 'psychic prison' and 'nstruments of domination'.

According to (Jackson, 2003) the constitutive rules are:

[1] Based on the emancipatory theoretical rationale, an emencipatory systems methodology is a structured way of thinking which is focused on cultivating objective and actual problem situations.
[2] Systems thinking as the foundational point for intervening. This core of the interpretive paradigm is to exercise its functioning on other systemic mechanisms akin to methods, models, tools and techniques.
[3] The constitutive rules of the methodology are found on the following guidelines:

a. Is based on the hypothesis that actual situations can be systemic and thus produce disparities on certain groups and alienation/marginalisation of individual participants,
b. based on an examination of the present systemic situation, the purpose is to identify asymmetries in participants and thus ascertain participants that have been marginalised/oppressed,
c. constitution of systemic mechanisms of intervention that act in order to extricate marginalisation and oppression from the system,
d. constitution of systemic mechanisms that will provide equality among participants in the problem situation,
e. quantitative analysis is employed to capture biases in existing systemic arrangements,
f. the process of intervention is systemic and aims to ensure fairness,
g. the emancipation of the marginalised/oppressed groups and individuals is not directly offered by the intervention process but is stimulated (encouragement of individual self-organisation),
h. emancipation and empowerment is the basis of the axiological mechanism against the successful operation of the intervention.

[4] The application of the emancipatory methodology from different users requires conscious reasoning for its adaptation in complex contexts, where it is differently applied and interpreted.
[5] The application of the emancipatory methodology affords innovation in terms of the theoretical and the practical. Therefore its outcome is to be aligned with:

a. the theoretical rationale of the methodology,
b. the methodology itself,
c. the methods models tools and techniques that are employed,
d. to the real world situation,
e. all of the above.

In summary, the *Emancipatory Systems Methodology* is a structured way of thinking based on the "Emancipatory Paradigm". Its systemic intervention strategy aims at ensuring fairness by allowing the alienating and oppressed members of a multiagency environment to take responsibility for their own liberation. This methodology assumes that the systemic multiagency environment can alienate individuals and oppress particular social groups. The problem situation is analyzed in the terms of the disadvantaged members of the environment. The model that is constructed to address the problem situation considers these systemic arrangements that cause alienation and oppression by allowing everyone to participate in its construction. A helpful tool to capture particular biases in existing systemic arrangements is provided by quantitative analysis. The oncoming changes are designed to improve the position of the alienated and oppressed members and are evaluated for their empowerment and emancipation. Methodologies of this category are the 'Critical Systems Heuristic' and 'Team Syntegrity'.

The *Postmodern Paradigm*: it aims to destabilise the modernist rationality that is present to the other three paradigms. It takes a less serious view of the concreteness of the multiagency environment and supports that learning about such an environment can be achieved by falsifying/manipulating the boundary conditions and thus claiming a space for disregarded opinions and encouraging variety and diversity. The 'carnival' metaphor fits well with this paradigm.

According to (Jackson, 2003) the constitutive rules are:

[1] A postmodern systems 'methodology' is a non-structured way of thinking, with an attachment to the postmodern and post-structuralist theoretical rationale, and is focused on altering rather than strictly improving real-world problem situations.
[2] Postmodern systems 'methodology' is a pluralistic practice and thus uses both systemic and anti-systemic idea as the basis for its intervention strategy. It employs methods, models, tools and techniques that also are inspired by systems ideas. In addition it also tries to re-evaluate/re-define them in a non-trivial manner.
[3] Granting that there are no strict constitutive rules in this methodology the following guidelines can be assumed as general guidelines:

a. there is a systemic 'violence' that produces marginalisation and oppression on certain groups and individuals,
b. existing power/knowledge structures are systematically deconstructed in order to reveal the problem situations,
c. a number of different systemic and non-systemic methodological mechanisms and practices are incorporated in the intervention process in order to surface marginalised positions,
d. in order to provide access in participation to marginalised groups a pluralistic set of systemic and non-systemic mechanisms are employed. It is assumed that this process allows 'access to act' to participants with a diversity of backgrounds,
e. quantitative analysis is not a desired method except in particular situation where statistical data are important in the deconstructive process,
f. in order to further advance the non-uniform character of the problematic situation and the participant's profiles the process involves amplification of localised actions for undermining the systemic pressure,
g. in order to promote diversity and the creative deconstruction of the situation at hand the intervening mechanisms ensure the perpetual re-evaluation and re-introduction of conflicting situations,
h. the axiological mechanism is functioning in terms of exception and emotion.

[4] The application of the postmodern 'methodology' from different users requires conscious reasoning for its adaptation in complex contexts, where it is differently applied and interpreted.

[5] The application of the postmodern 'methodology' affords innovation in terms of the theoretical and the practical. Therefore its outcome is to be aligned with:

a. the theoretical rationale of the methodology,
b. the methodology itself,
c. the methods models tools and techniques that are employed,
d. to the real world situation,
e. all of the above.

In summary, the *Postmodern Systems Methodology* is a way of thinking and acting based on the postmodern paradigm. In contrast to the other three methodologies its intervention strategy also uses systemic ideas in parallel with anti-systemic ideas. The intervention process takes the form of local strategising and subversion, and reclaims the importance (rather the disavowal) of conflict in order to promote diversity and creativity. The postmodern systems methodology takes for granted that a multiagency environment is constructed throughout a particular discourse and this always results to the marginalisation of particular groups and/or individuals. Hence it supports that the analysis of the problem situations is to be focused on revealing who and what is overlooked by existing power and knowledge structures. The diverse forms of pluralism that are employed, acknowledge the suppressed discourses to be revealed and heard. Therefore it enables the relevant stakeholders to express their diversity and their consent to the actions that are taken in order for the emerging situations to be handled within a multiagency working environment. The occurring changes are first evaluated on the basis of exception and emotion.

As we have seen, in the theoretical part at the beginning of this thesis, the various epistemological paradigms of empiricism and knowledge constitution, from positivist modernism to postmodernism, led to the insertion of the 'uncertainty principle' in any scientific inquiry and the observer at the centre of the process. This epistemological turn had a significant effect, not only to natural sciences, but also to social, organisational and systems sciences. In particular, the paradigm incommensurability and the assumption that intervention is a localised activity[144] led many researchers to accept the separateness of the aforementioned paradigms and thus adopt one of them and work within its limits. This theoretical and practical isolationism (Mingers & A. Gill, 1997, p. 3) towards research endeavour was a counter intuitive practice that made clear that no one paradigm could possibly contend with the challenges of actual situations. Hence, in the last two decades,

[144] in a specific paradigm

and after the influence of the postmodern paradigm of ontic/ontological heterogeneity, the research interest has turned to the exploration of diversity, multiplicity and the plurality of philosophical and methodological investigation.

The (de)constructive theoretical framework provides the means for recognising a number of different issues in broadening our horizons in terms of multi-methodological practice. These include:

[1] becoming conscious of a paradigm,
[2] committing oneself to a new paradigm and acting within it by contextualising multiple methodologies.
[3] provide a significant philosophical device for moving between paradigms

Therefore, we overcome the 'paradigm problem' (Midgley, 1997) of the amphiboly between paradigm commensurability and in commensurability. Instead, the methodological pluralism offered by the (de)constructive framework, in a similar way to the Total Systems Intervention (2)[145], acknowledges the possibility that any attempt to embrace in multi-paradigm multi-methodological pluralism involves the possibility that perspectives in the intervening process will not coincide. Hence, because the paradigm commensurability is not the fact, but nonetheless is as important as the incommensurability issue that relates to diversity, it is essential to recognise the significance of an approach that holds methodological principles while learns from the variety of paradigms. Similar to (de)constructive framework, (Flood & Romm, 1995a) identify this 'difficulty' of the paradox that emerges between stability and diversity in methodological pluralism and 'ironically' express, the notion of (in)commensurability.

7.2.4 (multi)Methodological pluralism and (de)constructive (a)teleology

For many theorists pluralism is the only way to deal with diversity and heterogeneity and it is wonderfully outlined in Ashby's law of the requisite variety which states that "only variety can destroy variety" (Ashby, 1964, p. 207) and means that the larger the variety of actions available to a control system, the larger the variety of perturbations it is able to compensate.

Methodological pluralism supports that the use of numerous methodological approaches in the course of research practice is a safer theoretical approach compared to theoretical monism which supports that under an epistemological paradigm there only multiple models to be exercised in multiple ways. Pluralists argue that no approach can be expelled

[145] The second version of TSI (Flood & Romm, 1995b).

from methodological practice and therefore are proposing that scientific inquiry should be an open and diverse practice. According to Feyerabend deconstructing the rules is sometimes as important as constructing them:

> *"...one of the most striking features of recent discussions in the history and philosophy of science is the realization that events and developments ... occurred only because some thinkers either decided not to be bound by certain 'obvious' methodological rules, or because they unwittingly broke them."*

And thus he continues that a pluralistic research model should incorporate in its method the inclusion of often marginal ideas:

> *"Given any rule, however 'fundamental' or 'necessary' for science, there are always circumstances when it is advisable not only to ignore the rule, but to adopt its opposite."(Feyerabend, 1993)*

Pluralists therefore support diversity in the sets of assumptions that form a particular paradigm and even further they propose that the re-evaluation of the appropriateness of the most prominent values (in and among paradigms) is a necessary task[146]. To support these ideas they propose that any research program (including design research practice) is mainly interested in the discovery of new paradigmatic values that alter and move forward its research agenda. The inclusion of counter-inductive approaches (i.e., counter-inductive with respect to current 'facts') often is considered a useful practice. The problem that arises here is of course that of complexity and its comparison with the limited resources that we often have available when innovating. The consequent questions are: How far can we go with inclusion? What is the limit of our capacity to experiment with multiple ideas? Are all ideas useful? How do we take decisions in complex situations (e.g., collaborative design contexts)?

As we have seen in the previous section, typically for contexts (e.g., collaborative design context) where the 'social' displays an important role, reference is made to three different paradigms that are characterised as:

[1] hard or positivist which treats the problem situation as objective,
[2] soft or interpretivist which regard the social implications (humans, human needs, actions etc) as fundamentally different and observed/interpreted,
[3] critical which considers both hard and soft but emphasises the oppressing nature of social systems and tries to provide means for against systemic violence, and finally,

[146] For a comprehensive review of multi-paradigm multi-methodologies and a general history of pluralism see (Mingers & A. Gill, 1997) and (Midgley, 2000, p. 159).

[4] postmodern which takes methodological coherence as the drawback in systemic analysis and therefore proposes openness in the methodological inquiry and inclusion in terms of social engagement.

As we have seen, often these paradigms are complementary but also they can be seen as incommensurable primarily because their assumptions are interpreted differently and thus are conceived as contradictory.

The different possibilities for incorporating, developing, manipulating, and using methodologies can be classified (Mingers & Brocklesby, 1997) according to a set of informing categories that include the type of the methodological pluralism/monism and its influence from multiple of single paradigms. These include:

[1] Methodological isolationism: Using one methodology/technique from a single paradigm. (e.g., only Soft Systems Methodology)
[2] Methodology enhancement: Improving the methodology in terms of the techniques/methods of another in the same paradigm. (e.g., cognitive mapping in Soft Systems Methodology)
[3] Methodology selection: select a complete methodology and transfer it from one paradigm to another (e.g., JSD used in SSM context).
[4] Methodology combination: mix entire methodologies, from the same paradigm, for the purposes of an intervention (e.g., cognitive mapping, root definitions under the postmodern pragmatic pluralism)
[5] Multi-methodology: segmenting methodologies from multiple paradigms and combining parts[147] (e.g., cognitive mapping and systems dynamics (Midgley, 1997)(Flood & Jackson, 1991)(Mingers in Stowell, 1995, pp. 18-50)).

According to the aforementioned analysis {see §7.2} and the pluralist conception of scientific research, a pluralistic, detached from monism, multi-methodological approach is needed to better explain the current status of participation and collaboration in design contexts, always under the condition that the issues of complexity and decision-making are to be clarified. The pluralistic methodology that is incorporated in this thesis is actually a meta-methodology or a multi-paradigm multi-methodology, since it employs the partitioning of different methodologies, from different paradigms, and then combining their parts to address problematic situations and identify appropriate solutions.

[147] The (de)constructive framework proposes here the re-evaluation of the constructed meta-methodological multi-paradigm multi-methodology to avoid becoming a grand-metanarrative {see §5.2.1}.

As stated by (Mingers & A. Gill, 1997) multi-methodological multi-paradigm pluralism is a process of "*combining together more than one methodology within a particular intervention*", rather to combine many methodologies under a single paradigm. Multi-methodological pluralism therefore for Mingers refers *"to the whole area of utilising a plurality of methodologies or techniques within the practice of taking action in problematic situations".* However, in a previous work Mingers et al. argue that the pluralism in multi-methodological practice is depended in a number of factors:

[1] Whether methodologies are mixed in the same intervention or across interventions,
[2] Whether they come from different paradigms,
[3] Whether specific parts of a methodology are combined.

It is therefore clear that in a complex environment, similar to a collaborative design (con)text, a multi-paradigm multi-methodological framework need to be considered. By considering these types of interventions in a collaborative design (con)text, the practical, emancipatory and technical interest in the multiagency environment can be explored and supported by the production of a pluralistic methodological framework. The advantage of the last type of pluralistic confrontation to a problem situation is that it allows a great flexibility in addressing and solving problems, by letting the tools, methods and techniques to be detached from their usual methodologies and paradigmatic boundaries and thus, used creatively in the newly evolving (con)text. Said briefly, this informs us that a (con)text's ability to control (intervener), cannot exceed its capacity as a communication channel or its capacity to interact within a complex environment. This means that (in)dividual's ability to intervene and apply control in a design (con)text is depended by its ability, as intervener, to process and communicate information as well as by its internal capacity to self-organise in order to adapt to environmental situations (whether this is an active, reactive, or passive (in)dividual). This implies that if we are to adapt to the changes of our horizon, our communicative and collaborative patterns of interaction within an environment of multiple (con)texts must be as varied as the patterns in the changes we are exposed to. To paraphrase Ashby: Only variety (methodological) can overcome variety (situation).

7.3 An (A)Teleological (de)constructive Multi-methodological Framework for Interacting in Design Contexts

An (a)teleological (de)constructive multi-methodological approach accepts that contradiction is an impossible task - although paradox is inherent in social practice and a possible cognitive assignment - while binary dualism is a relation that needs to be contested. It is historically evident that attacks on dualism have been employed from many disparate philosophical and scientific areas. The same applies and in the case of a theoretical framework that is to (de)construct the stability of the dual character of any type of binarism in communication and collaboration. Among others, creative and non-creative, consensual and non-consensual, participatory and non-participatory, purposeful and non-purposeful, teleological and non-teleological, collaborative activity is not to be considered a materially (to be) defined stable practice, but a network process that can

potentially be defined in terms of a quasi-representational model of systemic character that aims to illuminate the status of human participation in social networks. If Derrida's primary consistency defines deconstruction in naturalistic terms, and in particular in terms of a commitment to the concept of a metaphysical materiality, an essential commitment evident in the cognitivist, ethical and political project of naturalism which is continually contaminated by 'weak' types of naturalisms - that at a certain point collapse back to metaphysical supernaturalism -, then (de)construction is ready to accept a plurality of views towards a creative understanding of methodological processes rather than stable entities.

The antithesis of (de)construction and classical deconstruction is located at the problematic (in our view) acceptance of the latter to say what is finite and what is impossible only because it has already defined the possible. In this sense Derrida reinstates the metaphysical from a transcendental point of view – that is the possibility itself (Mullarkey, 2006, p. 7). Therefore with this manipulation Derrida remains trapped to the metaphysical, exterior point of view, where Language (writing) is the only representational medium capable of establishing any philosophical understanding. Language thus becomes the 'transcendental causation' of the 'end of metaphysics' (D. Wood, 2001, p. 312) and as Badiou argues, following Lyotard's argument for Grand Narratives, *"…the certainty of the 'end of metaphysics' proceeds within the metaphysical element of certainty…"* (Badiou, 1999, p. 31). Hence, the deconstructive dismissal of higher presence neglects the metaphysical irony that can affirm and negate transcendence.

Obviously this philosophical immanence of metaphysical exegesis is seen to exist everywhere, with a variable meaning. So the question that arises is 'whether it is possible to surpass immanence' and engage to empirical evidence free from mystical or hypothetical explanations that exist beyond the rational. The virtues of immanence in all philosophy are evidently open to a manifold of meanings, but historically all traditions - including, idealism, materialism, constructivism, naturalism, deconstructionism etc. – are involving some type of logocentrism: ideas, structures, correlation, meaning, relativism etc.

However in our case of methodological pluralism and the inherent affirmation to self-deconstruct (to be able to become critical at any point of methodological inquiry), to (de)construct is to provide an informative, temporarily non-contradictory, difference into each static element of the emerging binary opposition, and in doing so aims to destabilise the homogeneity and consistency of the un-deconstructed robust/blind-spot that is provided by the binary unity (of the difference). This aims to become a purely scientific conception of understanding self-reflexive methodological practice where metaphysical reality is a task that cannot to be *'fully completed or symbolised'*. It can be partly symbolised and thus represented as such and still remain an inaccessible 'site' of insignificant importance. In opposition to the naivety of the Heideggerian idea that metaphysics is not to be destroyed by science but to be complemented and thus

completed, we propose that a (de)constructive anticipation of reality is to carve up 'real' into an *'inside with no outside'* in many different quasi-representational immanent modes or categories: biological, mathematical, affective, scientific. Therefore, classical philosophy is transformed and revitalised into an integrative model where naturalism and classical sciences are complementary; and thus provides a critical and non-reductive approach to life and social sciences.

Then singular non-multi-methodological taxonomic views, epistemologically ground to an ontology of rigid and stable identities, which provide, at the cognitive level, an illusionary, free from contradictions and difference, understanding. The proposed (de)constructive multi-methodological understanding reaffirms that identity is always complemented with difference which, in terms of the early Derridean deconstruction, is always already supplemented by différance, a constant differentiation and deferral of meaning across a web of signifiers and significances which in turn participate in a symbolic network of reconfigured processes. This inherent *trace* which supplements the (de)constructive process is 'responsible' for the innumerable structural differences that provide the illusionary cognitive sense of binary hiatus. Therefore, cognition itself is non identical, but a 'slippery' concept. Nonetheless, cognition is an apparatus for understanding phenomena, even if these are at a constant deferral. Therefore, (de)construction is not a separating device or a unifying mechanism, but rather a gesture of continuous re-separating unification or re-unifying separation alike to the topological metaphor of a the Klein bottle, which paradoxically exist as boundary representations of the physical and the metaphysical. (de)construction's role is to both criticise/analyse and construct; it is at the same time a representation, a process that constructs the object of inquiry and an interpretative process of it. This semiotic character of (de)construction provides us with the grounds of a representational theoretical/cognitive setup that within the possibility of a multi-methodological approach overrides the functionalist, interpretative, emancipatory and postmodern systemic practices that focus on a stable type of identity; either pragmatic or metaphysical. (de)construction is to be thought as the demarcation of all stability and purity. Is an all-the-way-down quasi-representational process that does not seek a '*telos'* but rather a continuous (a)teleological and a-causal reality that is to be lived/experienced/cognised through multi-methodological thinking and reflexive practice. Following this argumentation, the emerging philosophical turn is to be observed as twofold: 1) provides a device for reasoning based on an all-the-way-down ontological framework[148], and 2) identifies/criticises the problem of discourse of the possibility of

[148] Not to be aligned with the various pragmatic frameworks where representation is a radical empiricism (James, 1912). Empiricism is a theory of knowledge that emphasises the role of experience, especially sensory perception, in the formation of ideas, while discounting a priori reasoning, intuition, or revelation. We do not assert here that experience includes both physical particulars and relations between them that need to be further explored in order to identify their 'concealed' meaning. Experience is a network of processes that can only be understood in terms of a quasi-representational device within the limits of a (con)text. If James accepts that transempirical entities may exist, but that it's not fruitful to talk about them, then (de)constructive thesis is about the non-existence of the

purely epistemic norms and political values that emerge within the naturalistic thinking. In spite of its apparent philosophical immanence, it tries to critique and describe its outside. It also acknowledges that there is no metaphysical device that can be implemented to provide these grounds. Rather such a 'device' will become apparent throughout the topic of the discourse itself and the quasi-representational medium that supplements and is supplemented by the process. The quasi-representational (non-dual) medium provides and is provided by (is the a-causal trace of) the 'event' and describes the 'evental site' where appearances of 'meaning' and 'intentionality' are to be experienced as grounded entities. Therefore, we do not conclude that (de)construction is possible in every moment, but we propose the need for a general scheme for the examination of the conditions under which it is possible. (de)construction in this phase is to be thought as an intentional process that when it 'pauses' things 'outside' our rational/empirical/cognitive horizon happen; in the un-symbolised reality, reality yet to be symbolic.

(de)construction as a critique of the metaphysical, poses the need and the ways for a search for the criteria to establish such an 'outside'. Thus, it is both critical and descriptive, it does not undermine, like radical deconstructionism, the possibility of experience, nor it suggests the experience of the impossibility (early and late Derrida). The causal *relata* of (de)construction do not fall prey to the infinite regress of determination {see §5.2.5}. The 'inherent' regress of the relativist tradition is paused by the possibility of the decision and so its immanence is a process of its unceasing redevelopment. Decision and thus presentation is the very condition of the representation of the un-presentable/multiple, that which is not yet ready-at-hand but stimulates our current practice of determination. (de)construction is in search of the supplementary trace, is an anticipatory process of events in an evental site of determination; a representation of immanent becoming. What is important in (de)construction is not reality per se, or the absolute ontological grounding of the real which resists symbolisation, but the onto-epistemological grounding or the ways that quasi-representational hypotheses are evaluated within the limits of ontological fantasy (ideology). This means that we are to act within a multi-methodological framework – appreciate, analyse, develop, and deconstruct – that does not provide final answers but the ways to construct creative tentative methods that will possibly lead us to offer

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transempirical, but about its creative, anticipatory constitution. Therefore we maintain that the (de)constructive understanding distances it self both from radical empiricists and phenomenologists. For James and the radical empiricists experience is a network of cognitive connections that are only a part of what is experienced in reality and therefore naturalistic descriptions of meaning and intentionality are of primary importance. On the other hand phenomenologists claim that meaning is an illusory sensation. (de)construction supports that experience is constructed and constructs reality in a creative, complementary, way, through an amalgam of reasoning, libidinal drives (Lacan's imaginary state) and symbolic interaction (Lacan's symbolic) and un-symbolised, inaccessible Real (Lacan's Real). Meaning and intentionality are important constituent elements of the process, but we never forget that are themselves only appearances - not Reality themselves - that constitute reality.

transient answers. This very multi-methodological framework is only a phantasmatic feature, an imaginary device or an ideological construct/manifestation that provides the reflexive means to act (creative process) rather than the concrete ends of success (creative outcome).

The application of such a theoretical framework is against both the aestheticisation[149] of knowledge and knowledge practice, as happened in radical postmodernism, but also against the neo-pragmatist philosophical position where the long-established questions about knowledge, truth, and representation should be expelled/rejected[150] (Boros, 1999). In their place we propose a systemic, rational and plural, methodological model for thinking and designing for communicative purposeful action and collaborative interaction. This leads us to propose a multi-methodological action research theoretical framework based on critical and pragmatic pluralism (Mingers & A. Gill, 1997) (Taket & White, 2000) and the (de)constructive (a-causal) framework of ontological and epistemological, systemic, networked relations[151].

7.3.1 Basic Concepts of Critical Pluralism and Pragmatic pluralism

Pragmatic and critical pluralisms are two in many ways different but also complementary traditions. Critical Pluralism denies the existence of a single, correct interpretation of any given methodological framework in any given paradigm and is quite similar in some of its aspects with Pragmatic Pluralism. Instead it tries to manage the methodological approaches by paying particular attention to the critical employment of multiple methods from multiple paradigms. The major argument is that previous approaches in critical systems thinking[152] did not generally managed to "*operationalise a multi-paradigm multi-methodology*" (Mingers & A. Gill, 1997, chap. 15).

Pragmatic pluralism is an inspirational device that inaugurated this change in critical systems thinking and helped for the development of critical pluralism. Briefly, in pragmatic pluralism the use of methodologies is founded on the grounds of postmodernist and

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[149] Aestheticise is to depict in an idealised, often, irrational manner, based on pure experience and the unintentional denial of the use of cognitive functioning to uncover possible meanings, to (de)construct. Often is related to pure criticism without practical effect/reflection. Is also linked to the pictorial turn in postmodern tradition (Baudrillard, 1975, 1994)(Jin, 2008).

[150] Rorty, one of the most important proponents of neo-pragmatism, argues that philosophical questions about knowledge should be eliminated from philosophy since there is no possibility to get outside of our mind and language.

[151] that is not tautological with methodological naturalism which entails the philosophical naturalist positions of causality and determination {see §5.2.5}. Rather it is concerned specifically with views about the (un)presentable contents of reality that are motivated by philosophical argument and analysis and thus relates deconstruction with ontological naturalism and philosophical naturalism (methodological debates that bear on philosophical practice, and in particular on the question of whether philosophy can manage with scientific methods alone)(Papineau, 2007, 1993).

[152] These include, among others, systems of systems methodologies (SOSM), total systems intervention (TSI) and their various replicas.

poststructuralist thinking where we "*move away from prescription and seek to maintain an open flexible stance, capable of responding creatively to the characteristics of a particular moment, continually disrupting the comfort of identification with a fixed theory or view and seeking instead to mix different perspectives*" (Taket & White, 2000). What is proposed is the recognition of the following features:

- the use of triangulation (in terms of data sources, methods, analysis team), combining parts of different methods (or methodologies),
- being reflexive,
- being adaptive,
- being critically reflective.

Within the context of multi-methodology critical pluralism is a rethinking of critical systems practice and therefore provides an overview of the background issues against which it is defined. These issues include a number of 'debates' that historically emerge within critical systems thinking: Is TSI meta-paradigmatic?, problems of incommensurability and feasibility, Selection and combination of methodologies, Splitting/partitioning methodologies, How critical is critical systems, the central role of the agent using methodology. These are thoroughly analysed in (Mingers & A. Gill, 1997, chap. 15).

Critical pluralism, thus, builds upon these 'debates' and identifies five major challenges that condition the rethinking of a critical approach. These include:

[1] Confusion on the distinction of critical and emancipatory systems: as it is evident from the analysis of the 'debates' that Mingers et al. outline in their thesis, critical pluralism accepts that *"genuinely emancipatory approaches will challenge the position of particular actors and groups within a situation, and thus cannot expect to gain the universal approval or acceptance of participants in a problem situation".* This means that any critical methodology is always local and not of universal influence and it will never become a grand narrative. Moreover, even if methodologies are designed to work in a particular context, appropriate usage is not guaranteed.

[2] Dismissal of the reliance on Habermas's theory of knowledge-constitutive interests: an overarching theoretical device can no longer provide the rational means towards critical appraisal. Critical theories are heavily 'contaminated' by the ends of emancipation and the distortions in knowledge. Therefore they are only to be seen as desirable and not necessary. They should be able to strategically deconstruct themselves their power, validity and abstractness (application in all contexts). Instead, critical pluralism proposes that methodologies should introduce locality in their horizon of influence.

[3] Critique of the inherent rationality of previous (modernist) theoretical approaches and the influence of power/knowledge on it (rationality): based on the Foucauldian

critique of the modernist project of rationality and emancipation, critical pluralism accepts that there is no Archimedean vantage point that provides us (interveners) objective knowledge of the situation at hand. According to this, truth or the reality of a situation is closely interweaving with the exercise of power in that very situation. Hence, truth power and self are interrelated notions and not realities and therefore rationality of an agent (intervener) that is part of the context is only relative to the degree of reflexivity that he/she employs to self-awareness of the situation.

[4] Postmodern critique of grand-narratives and therefore critique of methodological grand meta-narratives (i.e., Habermas's theory): critical pluralism is very similar to pragmatic pluralism in terms of combining the theoretical and the practical. Because of the inherent complexity of these two inseparable modes of action it accepts that there is no possibility that an underlying general coherent theoretical apparatus can be appropriate for all situations. This conception functions against the Habermasian critical theoretical device and proposes that theorising is always already part of a critical reflective practice (White & Taket, 1996).

[5] Critique of the subject that a critical theory refers to: this is a critique of the attachment of critical theory to a hypothetical subject that is characterised as universalistic, ahistorical, acultural, disembodied, (male) subject. Thus critical theory is not to be thought as a Grand meta-narrative that applies to all participants. It is not to work for an imaginary subject but instead it must be adapted in the actual cultural political contexts and thus identify individual participants' profiles.

According to Mingers et al., a multi-methodology supports the intervening process that an agent/intervening system (e.g., designer, design team) plans to perform in a specific context (e.g., collaborative design context). Therefore, the development of a multi-methodological framework is associated to a number of issues that are related to: the agents performing the activity, the available methodological and technical background, the observed situation of concern. Hence, they identify three notional systems and the relations between them.

These include the 'Intervention System', the 'Intellectual Resources System', and the 'Problem Content System'[153] [Figure 7-3], which, accordingly, refer to the agent/intervener or intervening-group/team/organisation, the potentially associated theories, methodologies and techniques that are possibly linked to an observed problem situation that constitutes an actual situation of concern (Mingers, 2006, p. 218).

[153] Mingers et al., based on Checkland's problem-solving system (Checkland, 1999), identifies the need to split it to the 'Intellectual Resources System' and the 'Intervention System'.

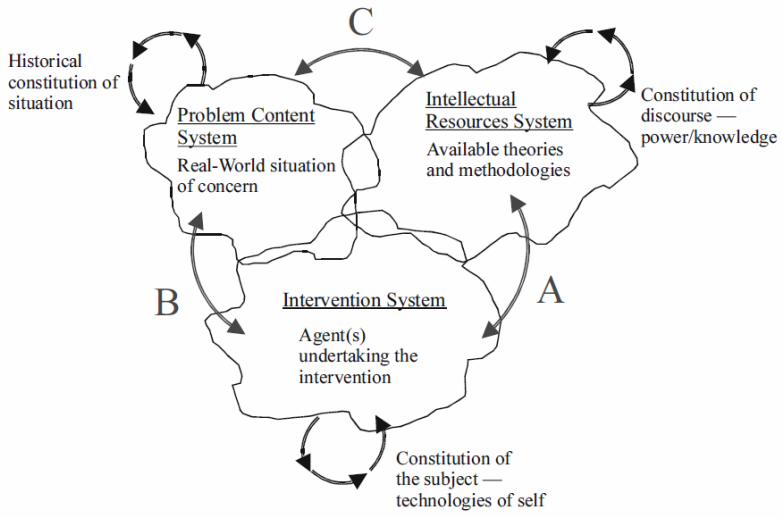

FIGURE 7-3 – CONTEXT OF PRACTICAL INTERVENTIONS: THREE NOTIONAL SYSTEMS OF INTERVENTION (MINGERS,2006)

7.3.1.1 Situation of Concern

In order to describe the 'Problem Content System' and the ways that communication takes place in it, Mingers et al. incorporates the Habermasian analytic scheme (formal not material) of three worlds [Figure 7-4]: the material (or external natural), the social, and the personal (or internal), supplemented by the medium of language which allows their differentiation (Mingers & Brocklesby, 1997; Mingers & A. Gill, 1997).

The *material world* signifies an instrumental technical attitude to nature. It is an objective and autonomous world of material things and physical properties, like space and time, and is considered to be independent of human beings. In general, this is a positivistic view of the natural world primarily because it refers to entities like natural laws that define the materiality of this world and are also themselves independent to any relationship, participation, or human involvement. Reversely, this material world provides the grounds for the necessary perturbations that, in turn, influence the personal world to construct its observation (experience) and consequently to alter the material world; but not its constitutive laws. The material world is the foundational source for the historical evolution of the other two worlds – the social and the personal.

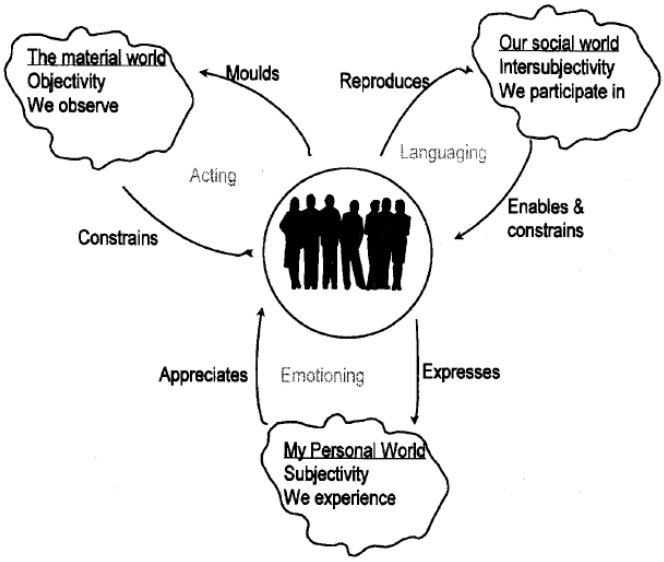

FIGURE 7-4 – THREE DIMENSIONS OF PROBLEM SITUATIONS (MINGERS,1997)

The *personal world* refers to the subjective world of mental states. It is only accessible to the individual subject and is represented through emotions, thoughts, experience etc. Although this world is considered as an emergent effect of a social construct like language, nevertheless it is restricted and ultimately bounded by the subjective self. The personal world is only expressed to others through various modes of communicative actions and its experience is based on hermeneutic and phenomenological accounts of the self. The *social world* concerns a societal intersubjective realm that human beings share. It is an objectively existing but abstract world of man-made entities, like language, mathematics, knowledge, science, art, ethics and institutions. The social world depends on humans and their relations but it is independent to the personal and imaginary world of the subjective. It is a symbolic domain of implicitly agreed rules, practices, norms, and meanings. Because of its Habermasian influence, the social world requires a mode of metaphysical consensus in order to be established. According to its definition, the social world is evaluating participants' actions in terms of its ever-evolving rules. These rules are not identical to the static rules of the material world, which are horizontally applied to every entity, but rather are differentially operating over different entities of the social world and thus, privilege and/or marginalise certain symbolic characteristics and structures over other.

To further extend the Problem Content System towards supporting a critical pluralist methodological framework Mingers et al. provide a set of two issues that are considered horizontally in all three worlds: *axiology* and *power/knowledge*.

Axiology is based on the Habermasian question of "how should I act" and is an important factor in decision making. Departing from the complexity of the material, social and personal worlds, Habermas identifies that this pluralistic environment is not possible to be absolutely determined by universal laws and therefore based on the classical notions of knowledge, rationality, effectiveness, morality, and ethics, proposes an axiological evaluation. This idealistic process provides the basic means by which agents evaluate their

previous activities and the situation in order to decide for their future actions with regard to the intervention. Correspondingly it applies to the material (or pragmatic) the social (or moral) and the personal (or ethical) worlds. Regarding the material, the criteria to answer this question are related to the 'purposive rational actions' or in other words with the most efficient means for the achievement of an agreed end, and vice versa. Regarding the social world, the criteria to answer this question are associated with the externalised processes that an agent incorporates in order to establish its position in the symbolic realm or what Habermas names social world. These are concerned with the principles of right and wrong or conform to the standards of social behaviour and character that agents exhibit in order to relate to other agents, constitutional laws, norms and practices that exist in the symbolic. Regarding the personal world, the criteria to answer this question are connected to the self-awareness that spontaneously emerges from the 'internal dynamics' or the organisation of the individual agent; being a human, a team or a larger social group that collaborates towards some imaginary objective (e.g., a design goal). These criteria focus in describing the reflexive processes that agents produce to express and understand their own being-in-the-world. These are mainly linked to ethical issues.

Power/knowledge is based on the Foucauldian philosophical complex network of ideas that concern the formation and supremacy of power conditions over other field-relations of the lifeworld. These include: power/knowledge and social relations, power/knowledge, and the formation of the self as subject. In his groundbreaking introduction on subjectivity and ethics, Foucault analyses the specific practices[154] that individuals 'methodologically' employ in order to constitute themselves within and through symbolic, socially constructed systems of power and domination (Foucault, 1988). These practices are described in a similar fashion to the double face of Janus or the duality of the Möbius strip or the Lacanian notion of 'Jouissance' which all refer to the capacity of the self to bear with the simultaneous awareness of the relation to the interior of the exterior and/or the exterior of the interior and thus *act appropriately*. From this viewpoint Foucault offers a set of four technologies that describe the ways agents act and reason when considering the constraints and peculiarities of the self and the social. These include:

- *technologies of production* that are related to the material world and refer to the direct operation on material entities,
- *technologies of signs* that are related to the linguistic medium and the processes of semiotic signification and communication,

[154] Foucault names these practices 'technologies' and instead of an instrumental interpretation of technology, Foucault used 'technology' in the Heideggerian sense as a means of revealing truth.

- technologies of power that are related to the self-awareness and behavior of the agent/self/subject and "and submit them to certain ends or domination, an objectivising of the subject" (Foucault, 1988, p. 18)
- *technologies of the self* that are related to the transformation of the self in order to become subject.

In thus, Foucault historicises the questions of ontology and through his critical analysis he provides informative ideas about the plasticity of the nature of the future of the constitution of methodological intervening mechanisms. In his view the critique of critical theory is not to seek the ends of the discovery of universal truths as in the Habermasian metaphysical consensual rationality and the nature of power. Instead Foucault, asks for an investigation of the contingency and manipulability of the boundary conditions – that emerged before our investigation in the personal, material and social realms - and thus proposes the transformation of critique itself from the 'Kantian teleological critique', to a genealogical critique of a (de)constructive ontology that work towards a *"possible transgression"* (Foucault, 1984, p. 46). This transgression refers to the transformation of the rigidity of the boundary conditions and agrees in large part with the multi-methodological intervening process.

7.3.1.2 The agency undertaking the intervention

Influenced by the modern and 'affirmative' postmodern ideas of individuality and heterogeneity, and the cultural and temporal relativity of knowledge, the 'Intervention System' is described in terms of agents (human beings, teams etc.) that perform the intervention. In particular, a critical action is the result of a specific distinct agent or group of agents and not the result of a universal, ahistorical subject (Kant, Husserl, Descartes), as used to be considered in the traditional critical theory. The knowledge characteristics and the personality of each agent generate a new combination of methodologies appropriate for the particular, emerged, circumstances. Despite the rules and the requirements of a generated methodology, the effectiveness or the limitations of its employment also rely on the actions of the participant practitioners of the methodology. Although these ideas depart from the diverse theoretical apparatus of the postmodern tradition, Frankfurt school's critical theorists (e.g., Habermas) also recognised their validity and accepted the importance of understanding individuals in terms of their fragmented multiple nature which is situated within material and social contexts[155]. Indeed, the idea that brings forward the consideration of the agent is related to its (assumed intrinsic) characteristics that according to (Mingers, 2006, p. 247) include: knowledge, history, relationship to the situation, personality, gender, values and commitments. Mingers et al. related the description of the agent to an autopoietic entity that lives and performs within a material,

[155] Habermas transforms his conception of the emancipated society and describes individual subjects as "undisabled subjects" (Habermas, 1994)

biological, cognitive/psychological and social symbolic (socio-linguistic) domain of interaction. Building upon the theory of autopoietic, self-producing systems (Maturana & Varela, 1979)(Luhmann, 1986)(Mingers, 1994), Mingers et al. support that this symbolic domain of interaction is the basis for communication and collaborative interaction. Thus, situate the embodied agent within this world of language, practices, norms values oppressions and distortions. As we will see in the following sections, from a psychoanalytic perspective, this world can be seen in parallel to the Lacanian Symbolic Order and its connectedness to the Imaginary and the Real Orders.

In a multi-methodological context the intervener or intervening system is thereby the agent that performs the partitioning, the mixing, and the constitution of the methodological system, regardless of the fact that the interpretation and usage of the methodological context is not necessarily connected through an efficient causal relation. Therefore multi-methodological practice can be exhibited in many different and often sharply, in purpose, contrasted ways. This is the basic problem that any critical theory has to face. The possibility that a methodological framework can be used in ways that produce more oppression and domination rather than emancipation was always considered an unsurpassable barrier for them.

The agency undertaking the intervention is thereby characterised in terms of a number of issues that are described always relative to the intervening process and the context of multi-methodological action. These issues include the appreciation of the situation, the analysis of the situation, the assessment of the situation and the choices to be made, and finally the actions to be taken. These activities of involvement define the agent, the process of intervention, and as a result the general framework of communication, collaboration and design practice.

Agency therefore is defined as a perpetually evolving, systemic process that continually relates itself with all of the other notional systems (Problem-content systems and Intellectual resources system) but also with the three basic worlds that constitute and are constituted by the situation of the multi-methodological intervention. To conclude with, critical pluralism supports that this process of the relationship of the agent with the multi-methodological context is a dual course of action: on the one hand the agent interacts with the flexible boundaries of the societal symbolic network that materialise in his/her horizon and also with the 'experiential' internal boundaries that are related to the biological, rational and emotional/imaginary drives.

7.3.1.3 Intellectual resources system

Following the aforementioned analysis, it is evident that for an agent to perform within a situation that involves the exercise of multi-methodological intervention, interaction with the intellectual resources systems are necessary means for developing a pluralistic synopsis of the related concepts. The intellectual resources system enables the intervening

agents to draw upon the variety of methodologies[156], techniques[157] and tools[158] that are available from a variety of paradigms[159].

According to critical pluralism, the characteristics of this system are classified according to its interaction/relation with the other two notional systems and can be described by the following two frameworks:

Framework A. : is related to the capacity that a multi-methodological context needs in order to define itself. Thus it focuses in distinguishing the actual resources that are suggested from the set of available methodologies. Consequently, it also identifies the relations of these contributions to the different stages of the problem situation and the different phases of the intervention. This framework is concerned with the mapping/linking of methodologies onto the multi-methodological device and thereby to identify the activities that need to be considered in the next stages of the intervention. It therefore relates the three different worlds (material, personal, social) with four different phases (Appreciation, Analysis, Assessment and Action) and tries to provide the important key questions that need to be answered for the particular problem-situation with the particular agents undertaking the activity. This process envisages that these questions will provide the methodological apparatus for 'driving' the intervention process. According to (Mingers & A. Gill, 1997, p. 431), such questions are not to provide final answers primarily because are not to be interpreted objectively. These are highly influenced by a postmodern critical anticipation of the real that interprets the actual in terms of a system of networked interactions and therefore relates its success or failure to the agents, the complexity of the problem-situation and the methodological capacity. These can be summarised in the following table [Table 7-2]:

[156] Methodologies are formal collections of general recommendations, guides, and guidelines or activities that aim to support an agent or participant in undertaking methodological research or practical intervention in a specific paradigm. Is often related to the question: "what is we are to undertake?"

[157] Techniques are particular purposeful actions that have a specific task to accomplish within the limits of a methodology (e.g. statistical analysis, root definitions in SSM). Is often related to the question: "how to undertake?"

[158] Tools are material devices or the general apparatuses that support the intervening processes by providing the basis for techniques (e.g., computer hardware/software) of methodologies (e.g., STRAD for strategic choice (Friend & Hickling, 2005)).

[159] Paradigm is considered the broad worldview (weltanschauung) based on a general collection of fundamental, often philosophical or theoretical, assumptions that attempt to specify the characteristics of the research and intervention that can possibly emerge after these beliefs/assumptions. Is often related to the question: "why to undertake?"

TABLE 7-2 - IMPORTANT PHASES AND DIMENSIONS FOR THE LINKING PHASE OF AN INTERVENTION (MINGERS & A. GILL, 1997, P. 430)

	Appreciation of	**Analysis of**	**Assessment of**	**Action to**
Social	Social practices, power relations	Distortions, conflicts, interests	Ways of altering existing structures	Generate empowerment and enlightenment
Personal	Individual beliefs, meanings, emotions	Differing perceptions and personal rationality	Alternative conceptualisations and constructions	Generate accommodation and consensus
Material	Physical circumstances	Underlying causal structure	Alternative physical and structural arrangements	Select and implement best alternatives

For Mingers et al., *appreciation, analysis, assessment and action* are therefore the means for describing this networked development of the multi-methodological context that in turn will inform all stakeholders for designing the intervention. *Appreciation* is related to the "understanding of how the situation is" or in other words is an identification of the undertakings of the situation that need to be addressed. Is an appreciation of the situation as experienced by the interveners/practitioners involved, and/or expressed by any other participants in the situation. This is realised (assumed as on non-objective knowledge) through the classification of various concerns including: the development of the general/abstract background of the inquiry, an introductory setup of the basic data by incorporating empirical methods (interviews, experiments, surveys, qualitative approaches etc.). *Analysis* is related to an "explanation of why the situation is as it is", and therefore refers to the study of the underlying structures and constraints that procreate the specific interpretation of the situation. In the phase of *assessment* the agents explore the ways in which the problem-situation could be other than the one that is offered as legitimate from the analysis. This is a process of reversal of the rules and constraints and involves an inverse interpretation of the foundations of the problem situation. Assessment therefore becomes an undermining mechanism of the assumed descriptions of the situation in terms of alternative causes and explanation courses that can possibly alter potential constraints in the initial observation of the situation. It includes re-interpretation of the current representation of the problem situation and inference to other situations. This provides the, assumingly necessary, plurality of a secondary observation after the analysis. The last phase is *action* which is about to bring the first normative changes in the intervening process.

Framework B. : addresses the problem of partitioning methodologies from different paradigms, and informs for the ways of these parts to formulate new multi-methodologies. It is based on the idea that interventionist innovation can be created by 'dismantling' methodologies and using their concepts, techniques, and tools to fabricate, a detached from a specific (previous) paradigm, multi-methodology. This means that representational models from one theoretical background are imported and tested against the different contextual ideas in different paradigms and therefore become quasi-representational means rather than qualified conditions that certify the validity of their claims. Hence, this process of 'dismantling' involves the decomposition of existing methodologies in a systematic way so as to be able to then construct a different plural methodological framework. The combining of the elements, functions, and purposes of the existing methodologies to a new multi-methodological context is defined through a number of distinctions:

[1] Between the philosophical questions (why)
[2] Between the methodological question (what)
[3] Between the techniques employed (how)

Therefore the development of a methodology is informed by the philosophical assumptions (1) (which might later themselves be modified) and focus on defining 'what is to be done'. This process is partitioned in stages that are justified in terms of the basic principles (2) and actualised by a set of activities and techniques (3). Evidently this is a networked process: while a technique has a purpose or output, in the context that it is imported from, it becomes a quantified model and its values are always related to the methodological principles at hand. Additionally, the methodological context that is decomposed, and transferred in a different paradigm, is also re-interpreted under the 'presently' accepted principles of the current philosophical assumptions.

Therefore the purpose of constructing a multi-methodology is not to achieve a desired end or some anticipated grand vision through final causes. A multi-methodology provides the formal quasi-representational model that is oriented towards the development of a general conceptual account of some basic, abstract requirements that inform the agents of the intervention and the problem-content situation participants of what is the current state of affairs regarding the present (or presence of) understanding of the interpreted issues[160].

[160] The present is becoming an absence and the final goal an ever illusive and abstract (non)necessary goal. This is what basically differentiates critical pluralism from interventionism.

7.3.1.4 Summary

As we have seen each of these three notional systems is networked with the others in a way that they constitute the basis for the representation of a multi-methodological context. Therefore, Mingers et al. identify these relationships between the systems as follows:

[1] Relations between 'Intervention System' and 'Intellectual Resources System'.
[2] Relations between 'Intervention System' and 'Problem Content System'.
[3] Relations between 'Problem Content System' and 'Intellectual Resources System'.

The analysis of the aforementioned relationships is primarily oriented towards establishing the initial actions of appreciation, analysis, and assessment of the situation of concern, as well as, the actional creative intervening processes that are related to the planning and/or the design of the intervention itself. As we have seen these relations and the 'semi-structured' character of the notional systems are under continuous transformation in response to the situation at hand. This means that the referential character of these notional systems is to support the process of critical reflection that is inherent in the methodological development.

To conclude, in critical pluralism the vantage point is located at the dichotomy of actual participation within a problem situation and critical reflection about the intervention determining the particular combinations of actions and methodologies that are employed (Mingers & A. Gill, 1997). Therefore critical pluralism refers to a multi-methodological process of a continuous circle among reflection, judgement and action. This process resembles in a large part the (de)constructive pluralist multi-methodology, it provides the conditions of rationalisation and the discursive modes of critical engagement, it is not a teleological, solution focused, practice and therefore it does not provide final judgements towards an imaginary/ideal end. Hence, it provides an interesting starting point from which a (de)constructive multi-methodological framework can be initiated. The intervention becomes a process rather than an event. The intervening processes as well as the multi-methodological exploitations, 'operationalise' the static understanding of the problem content system as well as the intellectual resources systems and the intervention system. It is this very property of the divergent and processual character of the multi-methodological turn - inaugurated in critical pluralism -that we accept as important[161] for the development of our (de)constructive multi-methodological framework.

7.3.2 A (de)constructive Multi-Methodology for Design

[161] primarily because it takes the greatest break from classical critical modernism.

Whereas ontological modernism deems the individual interpreter as an expert and master of the design situation, and thus constructing a reality in terms of an idealistic interaction with a design problem content situation, radical postmodern approaches displace the consideration of design intervention within a social constructionist framework. Hence, while for interpretivism the 'reality' of a situation is created in the mind of the intervener, in postmodern approaches 'reality' emerges 'out there'. Following the (de)constructive ontological framework and based on a (con)textual emergence of the actual situation, we move the focus of analysis from the individual, the socio-cultural, and the absolute positivist real, towards a more complex and less defined phenomenon that of (con)textual interaction, which is based on the mutual interaction of the three. (de)construction, following the postmodern disavowal of absolute reality, does not seek eternal truths or solid methodological devices, but rather attempts to proceed from, and within, the local site of the situation and provides the means for intervention to emerge from a local strategising among participating (in)dividuals and the (con)text.

The definition of design as a one-time-process design-document construction that can be initially outlined, and then followed as a recipe or a rule, or even as a set of guidelines that will lead us achieving our aims, points to the development of a rule-based method on how-to-design. Instead, what we propose here is a (de)constructive notion of design or a theory that makes us look at a problem situation differently. A (de)constructive methodology does not provides a prescriptive/normative model (e.g., a method or technique) for designing, but rather a quasi-representational description or general set of processes that emerge out of the interaction of a number of different (in)dividuals in relation to the observed limits of a problem-content situation. The design situation or the design (con)text is described in terms of the (de)constructive ontological framework, where all entities are considered equally within a network of interactions. Therefore, 'design intentionality' is not considered an absolute property of the (in)dividuals, but rather an emergent process that derives from their interaction that takes place within the (con)text. Consequently, *intervention* for collaborative design, as outlined within the (de)constructive framework, is not an external process or a property of some (in)dividual, but instead it emerges from the dynamics of the (con)text and involves the negotiations among all types of (in)dividuals (active, reactive, or passive assuming that the latter are represented).

Taket et al., Mingers et al., Jackson et al., and Midlgey at al., among others identify that intervention, or in our case intervening for '*interaction for design'*, is a double concept involving methodological activity and reflection upon this activity by acting methodologically and reflecting upon produced meta-methodological narratives. This suggests that we design and we reflect upon our designs by '*design thinking'*, and we reflect upon our thoughts by combining knowledge from different, practices, methods, methodologies, and disciplines. Consequently, in this process of constant 'differentiation and deferral' we reflect upon our epistemological and ontological assumptions and thus, we ontologically - through a quasi-representational model/framework - redefine the ways we (de)construct our ways of thinking and the means for producing ontological assumptions.

Therefore, the (de)constructive ontological framework participates in the (con)text of the intervention and describes, without producing it, the ways it is constituted. The (de)constructive framework as a theoretical device is similar to the 'three worlds' introduced by Habermas and advanced in terms of critical pluralism to a descriptive model for clarifying the 'Problem Content System', the Intellectual Recourses System, and the Intervention System. However, we argue that a reconstruction of aspects of this theory, in terms of the psychoanalytic Lacanian model and the metaphor of the continuity that is offered by the three-Klein model, is necessary in order to formulate an ontological quasi-representational theoretical framework for intervention. This (de)constructive ontological framework reflects upon the structure of a language that is supplementing the understanding of the (con)text, without however to purely define it, and it provides an underlining claim that assists in reflecting upon the variety of issues that are to interact within a (con)text. For this reason, the (de)constructive framework, based on a design evolutionary process which constitutes its language, identifies the hyper-cyclic continuity of differentiation, translation and stabilisation as the underlying quasi-representational mechanism that links and produces the related Orders of the Imaginary, Symbolic and Real, which in turn constitute the discourse of signification in the design (con)text.

The three Orders describe the relationship of the (in)dividual with the symbolic environment and the un-symbolised underlying material. This resembles to the personal, social, and material worlds that Habermas describes, but also it offers a non-separating ontological understanding of them, primarily because of its explanatory powers of ontological continuity in terms of a non-stratified understanding of initial conditions: interpretation of the problem content, the problem content system, the intervention system, the intellectual resources system, and the practice of interpretation itself. On the other hand, the processual components allow the linking of the three dimensions of the Orders, and thus inform the development of a pluralistic methodology.

The (con)text of a design situation, where intervention is taking place, is seen as the emergent property of a system of relations, which include four major participating (in)dividuals, who exhibit active, reactive, and passive becoming towards the development of an interaction continuum. The role of (in)dividuals is obviously important in understanding how methodological practice is established in the (con)text. Therefore, before outlining the (de)constructive process in action, we will provide a short description of the role of (in)dividuals in the (con)text.

7.3.2.1 The Role of (in)dividual Participants

The possibility that a methodological framework can be used in different ways and that it might produce more oppression and domination rather than emancipation, in a (de)construction theory is not considered an unsurpassable barrier, as in critical theories, rather it is a quantifiable factor the produces more complexity and plurality to the system and therefore increases the necessary diversity that is considered an important factor for creativity; for trying harder to (de)constructively overcome the newly introduced constraints. From a (de)constructive perspective, all actions or even hypothetical inactions (observed as such) of the (in)dividuals reinforce or struggle against the temporally existing state of affairs. The presence of any oppressive grand-narrative that has been established in a (con)text, is the source for change and differentiation that inevitably will bring forward new presences that in turn will be (de)constructed. Therefore, a creative (in)dividual is a participating entity that critically observes these vicissitudes and strives to intervene in order to secure his/her relation with the (con)text and at the same time mobilise other (in)dividuals to re-arrange their connections and thus, re-introduce a new dynamic setting for interaction. For (de)construction, the creative (in)dividual is a participant and possibly an active decision maker, always already responsible for his/her autonomy and the possibilities that brings to his/her horizon. Power exhibits a dual character on such an (in)dividual; it is both the restricting and the enabling force that alarms perturbations on any other (in)dividual. Therefore, the (in)dividual is an autopoietic entity (Maturana & Varela, 1975) of processual character that makes every effort to deal with the calibration of his/her 'jouissance', by bringing equilibrium and self-organisation against any type of excessive stimulation from his/her environment. Therefore, the role of the (in)dividual is, by participating, to engage in multi-methodological intervention in order to regulate too much excitation, stimulation, or perhaps much too little as might be seen in certain inertial states of the (con)text. This will bring a new state of affairs in the (con)text and force others to also self-organise in order to participate in the (con)text and in their terms to reconfigure its dynamic relations.

According to (Foucault, 1982, p. 208), this critical moment occurs within the agonistic (con)text that creative (in)dividuals are faced with. This is a moment where the decisions are to be taken, although these, in their pure existence, remain latent within the Imaginary Order, but are represented through the Symbolic Order in the rest of the (con)text, and thus re-arrange it. It is the critical instant where praxis is pre-occupied by the question of "what should I/we do now?", towards intervening for a specific situation that requires interaction (probably for solving a problem or if seen from a non-teleological perspective, just to re-arrange connections). Of course, intervention by multi-methodological practice does not ensure that a successful intervention is actually taking place (i.e., that by intervening, creative (in)dividuals force the network to align in the way they anticipate). As (Mingers, 2006, p. 247) rightfully states for interveners or in our case the creative (in)dividuals, *"We always have to make choices, to act or not to act, to move in this way or that, circumscribed by the apparent constraints and absences of the social and material worlds on the one hand, and our own personal world on the other Intellectual resources system is a process"*. This means that everything in a (con)text is considered a process,

rather than a stable concrete entity. This a-causal understanding of participating entities provides us with a perpetual interactive process, where both (in)dividuals and connections in the (con)text are to continually redefined by differentiation, translation, and stabilisation.

If creative (in)dividuals are considered the main interveners in terms of the traditional interpretivist and critical paradigms in systems intervention, then in a (de)constructive theory, we anticipate that it is not necessary that (in)dieviduals always will exhibit creative behaviour in a (con)text. This has been made obvious by our categorisation of their self-organising properties (becoming) and their interaction becoming in the (con)text in terms of active, reactive, and passive.

To further clarify the role of these three categories of (in)dividuals in the (con)text we provide, along with their descriptions, a set of informing examples.

Active becoming (in)dividuals are active participants, which translate the (con)text by mobilising others, representing methods, methodologies and techniques, and thus become by self-organising in terms of an extroversive interaction. Such (in)dividuals are usually highly influential entities that focus in differentiating the (con)text. These (in)dividuals are the typical example of communicators that continually bring new ideas to the (con)text and at the same time open up to accept influences (connections) in order to further increase their plurality. Their complexity is not necessarily stable, primarily because their tendency to self-organise is limited to extroversive behaviour. Usually such (in)dividuals do not hold strong connections with other. For example, these (in)dividuals attempt to produce heterogeneity on the (con)text and their activity is considered quite informative in providing fresh ideas that will influence others to revaluate their connections in terms of the newly introduced connections. These ideas can be considered as either informative or prohibiting. In both cases, they advance the status of the (con)text to either accept them and easily adapt them to its interactive processes, or to be forced to establish new connections (translate) in order to retain its stability.

On the other hand, reactive (in)dividuals are similar to active (in)dividuals, in terms of influencing, but focus in stabilising the existing connections in the (con)text and thus, retaining the current established situation. These (in)dividuals are not newcomers in the (con)text, but are usually stable entities that participated in the foundations of the (con)text, or were introduced by others mainly to function as attractors that they organise the (con)text in terms of their stability. Examples of reactive (in)dividuals include experts, who organise the network in terms of their power to incorporate established paradigmatic knowledge that is difficult to change in terms of the dynamics and the current state of affairs of the (con)text.

Passive (in)dividuals are influential means in the (con)text that are usually represented through others and exhibit passive becoming and they do not self-organise. Passive

(in)dividuals are seen to overcome their neutrality primarily because their representation through others. This means that they can become highly influential entities in the (con)text in the case that their representation in the (con)text is accepted, and thus produces many connections with others. Examples of these (in)dividuals include in-animate entities without self-becoming but informative enough methods, tools, laws, rules, legislations, environmental issues, hardware etc.

7.3.2.2 Interpreting the (con)text

While paradigms can be considered as formalised shared assumptions held in common be (in)dividuals, creative (in)dividuals, who exhibit active, reactive, and passive behaviour, can establish iconic paradigms that inaugurate the 'reality' of a (con)text. These interpretations consist to a working hypothesis, a model or a text that can further be developed to an actual description of a (con)text. These virtual paradigms do not co-inside with the actual establishment of grand-narratives, but are partly the result of an unrealistic expectation that interveners, or creative (in)dividuals without an actual (con)text, establish in order to pose the possibility of communicating an actual (con)text in the symbolic. Depending on the actual connections that can be established, or have been established prematurely to the observation, (con)text can be stabilised in the Symbolic or vanish.

A (de)constructive methodology can be initiated through an analytical understanding of such (con)texts by: interpreting which are the (in)dividuals, examining the (in)dividuals, recording interactions among them, identifying strong links, adversaries and contributors, constructing basic outline of the (con)text, recording connectivity, and identifying possible purposes.

Recognise the (in)dividuals: Build a list of the (in)dividuals that potentially (will) participate in the (con)text. These (in)dividuals can be either entities of discontinuous (e.g., human participants) or of continuous (e.g., non-human entities, such as organisations, methodologies and methods, tools or techniques, technologies, artefacts) becoming.

Examine the (in)dividuals: Identify the representation of (in)dividuals on the (con)text. In this stage, a list of the characteristics, the general profile of (in)dividuals is generated. This list can include a variety of different personal traits, roles, power and influence on the (con)text, capacity to mobilise others, physical characteristics etc.

Record interactions among (in)dividuals: Create the possible connections between (in)dividuals and thus, record their relationships in terms of communicative interaction, confluence, associations, and conflicts among others.

Identify strong links: It is considered important to identify connections between (in)dividuals that are constitutive for the existence of the (con)text. This requires of interpreting and recording the strongest links that are assumed to define the most basic organisational structure of the (con)text. This will probably be based on an early understanding how the (con)text is organised around powerful (in)dividuals.

Identify adversaries and contributors: Create a list of (in)dividuals that seem to promote connectivity and those that inhibit it. Therefore, from this observational activity, the intervener can identify possible future breakdowns and emerging strong links. This process is not teleological and it does not necessarily distinguish or discriminate (in)dividuals.

Construct basic outline of the (con)text: Following the aforementioned actions, an intervener can construct a basic ontology-chart of the most important connections between (in)dividuals. A number of different symbols can be used to give particular emphasis on connections of differing importance or special relational connectivity.

Record connectivity and identify possible purposes: By observing the connectivity of the (con)text, the intervener can provide a first draft outline of the possible tendencies in the (con)text, and thus develop a first appreciation of the possible purposes that might emerge in the future.

This process of recording a basic structure of a (con)text is a first step of representing the current situation without actually being involved in the process of its development, if it is assumed to actually exist. Although observing externally is not particularly influential for the actual (con)text, if the intervener considers that this is a semiotic process that offers a first representation model, then he will be forced to include him/her self within the (con)text as an (in)dividual. Assuming that the intervener is an (in)dividual participating in the (con)text in terms of making actual connections with other (in)dividuals, then it is considered necessary to also include its own representation on the initial interpreted relations of the (con)text. The concept of the represented (con)text can further be analysed in semiotic terms based on the (de)constructive framework. The constitution of a (con)text is to be seen as a representament of objects observed by some interpretant. This is an imaginary relation of the interpretant with a symbolic world that is represented to him/her through the 'barred Other' and refers to a Real that prohibit symbolisation. In Peircean terms this the relation between an immediate object, which is the object as referred to, with the sign and a dynamical object, which is the independent object that is pointed outside the sign. Therefore, we observe that the interpretant is also a dynamical interpretant that is included in terms of representation in the (con)text. This constitutes a powerful semiotic relationship between the interpretant, the represented object, and the dynamical object of the Real and offers a way to ontologise, in referential terms, the interactions and processes that 'take place' in a (con)text. If we also consider that the (in)dividuals are entities that participate in the (con)text and exhibit organisational behaviour in terms of active, reactive, and passive becoming, then we are to understand that further steps are needed towards the development of an intervention process that the interpretant should exhibit from within the practice of participating and translating the actual connections of the (con)text. This means that the intervener should creatively participate in the (con)text by not only observing and describing the conditions of interactions, but by providing new connections through the representation of new

(in)dividuals, like methodologies, methods, techniques etc, that he/she will attempt to introduce and connect to the (con)text. The focus of the following study will attempt to provide the means that clarify this process of (con)text translation that can be realised through the differentiation of the current status of the (con)text, translation of existing and newly introduced connection and (in)dividuals, and finally the necessary stabilisation of the (con)text through a perpetual process of analysing, selecting, and synthesising.

In the next section we introduce the actual incorporation of the core functioning of a (de)constructive framework for the interactive analysis through participation in a (con)text.

7.3.2.3 The (de)constructive Framework in Action

As a process, a (de)constructive intervening activity in actual situations provides the conditions of rationalisation and the discursive modes of critical engagement. It is not a teleological solution-focused practice and for this reason it does not provide final judgements towards an ideal end.

In order to promote the (de)constructive theoretical framework to a multi-methodological pluralistic framework for understanding and intervening in design (con)texts, we identify the following system of relationships, between (in)dividuals, the (con)text and the processual components of differentiation, translation and stabilisation that are interpretatively considered to be observed by an (in)dividual that acts as an intervener. This intervener that acts from a non-Archimedean point of view, participates in order to configure a multi-methodological network of interactions/connections, between (in)dividuals (e.g., other methodologies, techniques, tools), and promote it for evaluation in the (con)text. This means that a multi-methodology is it self a network of interactions that connects to an existing (con)text of practice. This multi-methodological network is not a separate network that intrudes in the design (con)text, but another (in)dividual that evolves or becomes by self-organising, through representation, and in turn reconfigures the (con)text. This non-stratified ontological understanding of methodologies can be explained through the processual characteristics (differentiation, translation, stabilisation) of (de)constructive theory, that apply to both (in)dividuals and their connections for the constitution of the (con)text.

By combining these two factors, we introduce the following table [Table 7-3] of guidelines, which can be used to map (in)dividual and (con)textual characteristics and interactions that can be further used to understand how to link (de)constructively methodologies, techniques, and tools, similar to the logic of critical pluralism, interpretivist, and other pragmatic paradigms of the past.

TABLE 7-3 - PROCESSES OF THE (IN)DIVIDUAL AND THE (CON)TEXT THAT ARE BEING (DE)CONSTRUCTED

	(in)dividual, connections, and (con)text			
(de)construction	Interaction for design activity	**Imaginary ((in)dividuals)**	**Symbolic (connections)**	**Real ((con)text)**
	Differentiate	[What happens in 𝕊] Identify methodologies that potentially provide analysis of the 'cognitive status' of (in)dividuals. Analyse personal dimensions, views, beliefs, type of organisation (becoming), rationality. Explore viewpoints.	[What happens in 𝔸] Identify methodologies that analyse the current status of the connections between (in)dividuals, in terms of connectivity practices and power relations.	[What happens in A-S] Identify methodologies that analyse the current status of the (con)text in terms of primary aims (e.g., design activity).
	Translate	[How to change 𝕊] Identify methodologies that will provide alternative conceptualisations and will potentially motivate (in)dividuals.	[How to change 𝔸] Identify methodologies that will potentially reconfigure the connections between (in)dividuals by selecting ways of translating existing structures.	[How to change A-S] Identify methodologies that will potentially reconfigure the (con)text in terms of primary aims (e.g., design activity).
	Stabilise	[How to organise 𝕊] Identify methodologies that will mobilise	[How to organise 𝔸] Identify methodologies that will potentially	[How to organise A-S] Identify methodologies that will potentially

		(in)dividuals to self-organise and construct appreciation of the situation.	stabilise the connections by producing strong links between (in)dividuals.	stabilise the (con)text in terms of primary aims (e.g., design activity).

A multi-methodology in (de)construction is not a highly structured set of strict guidelines or activities that assist (in)dividuals to undertake an intervention. Rather the pluralistic multi-methodological practice in (de)construction takes place within the limits of the networking processes that occur because of the interaction processes and the potential purpose of the (con)text. Therefore, a (de)constructive multi-methodology informs (in)dividual interveners that intervention practice is guided by the interaction practices that occur in the (con)text and thus particular practices (e.g. design, communication, collaboration, coordination etc.) are emerging, because of the dynamics that are constituted among the (in)dividuals, based on the dynamics of the (con)text. This (de)constructive process obviously alters (in)dividuals, the connections, the (con)text, and the final purpose.

The processes of multi-methodological differentiation, translation, and stabilisation is closely interwoven with the actual interactive processes that take place in the (con)text. The methodological stages of a methodology that is introduced in the (con)text, are translated according to the linking phases and dimensions that are produced between (in)dividuals. Accordingly these (in)dividuals, based on latent philosophical principles that are coded in their Imaginary state, they perform in the (con)text. These philosophical principles vary and can be categorised in terms of ontological, epistemological, praxeological, and axiological understandings. These are not directly visible to the (con)text, but can only be surfaced through the mode of (de)constructive practice at the methodological level.

This process of philosophical grounding is highly dependent on the specific (con)text of interaction and the (in)dividual's background (often seen as black boxes) as well as the emerging purpose. Following this necessity, a creative (in)dividual participates in a (con)text by representing and applying methodologies (continuous becoming (in)dividuals), relative to a representation of the purpose that is transferred and related to the 'barred subject' $\mathbb{S}$ through:

[1] 'differentiation' by identifying methodologies that analyse the Imaginary, the Symbolic, and the Real,
[2] 'selection' by identifying methodologies that potentially provide a reconfiguration of the Imaginary, the Symbolic, and the Real,
[3] 'stabilisation' by identifying methodologies that will potentially provide a temporal equilibrium in the Imaginary, the Symbolic, and the Real.

A multi-methodology is an (in)dividual that functions as a strategic entity upon which other (in)dividuals communicate through its representation. For the assumed purposes that are projected behind the (con)text. A multi-methodology's role, as any other (in)dividual, is to trigger change on the (con)text; is just another difference that makes a difference.

In order to further clarify the influence and the representation of a multi-methodology in a (con)text, we will provide a brief description of the process of interaction between (in)dividuals as provided by the (de)constructive theory. If we assume two (in)dividuals ((1) and (2)) interacting within a (con)text, then they are represented in the Symbolic as 'barred subjects' $\mathbb{S}_1$ and $\mathbb{S}_2$ and are respectively included in 'barred Other' $\mathbb{A}_2$ and $\mathbb{A}_1$ [Figure 7-5].

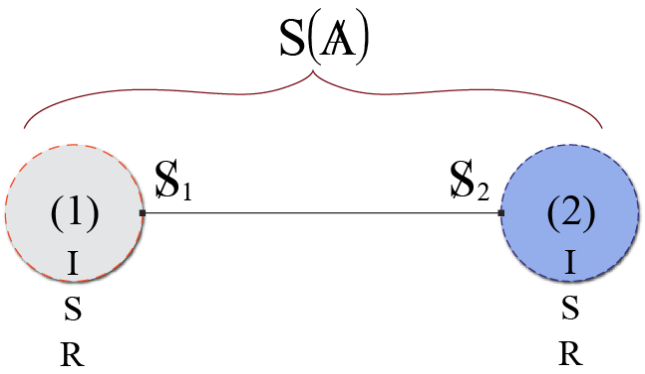

FIGURE 7-5 – BASIC TYPE OF INTERACTION BETWEEN (IN)DIVIDUALS

Following the (de)constructive framework, both (in)dividuals interact through a model of representation that is including a continuum through their Imaginary, Symbolic, and Real. In terms of (con)textual reality (as represented in the network of interactions), access to the Imaginary and the Real is prohibited and subjects $\mathbb{S}_1$ and $\mathbb{S}_2$ are seen to interactively communicate in the medium of the Symbolic Order. This is the area where methodological intervention is seen to be taking place. Such an intervention attempts to provide the quasi-representational means, upon which (in)dividuals (or 'barred subjects') negotiate for the connections that will be made in the network. If we include that these 'barred subjects' have unconsciously access to the Imaginary and the Real, then the meaning of interaction is emerging at the surface of the three Kleins [Figure 7-6].

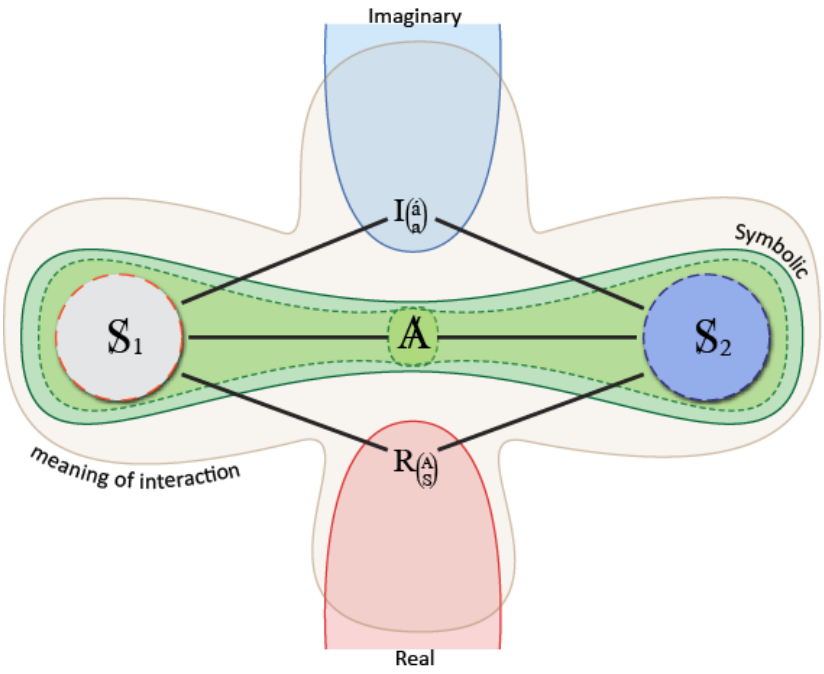

FIGURE 7-6 – NEGOTIATION OF METHODOLOGY IN TERMS OF INTERACTION

Therefore, (de)construction for a methodology within the limits of a (con)text means differentiation, translation and stabilisation in every single Order. The result is change in all directions: (in)dividuals (including methodology) and (con)text. Methodology, and the (in)dividual that is representing it, is under a continuous state of (de)construction while (con)text also shifts its dynamics in through the adaptation of other (in)dividuals to the newly introduced state of affairs.

7.3.3 Summary

As we have seen, this process of composing and decomposing methodologies is not taking place externally to the (con)text of interactions, as in previous paradigms, but is configured internally through the dynamics of the (con)text. It is evident that interventions in situations or (con)texts of practice is not to be seen conditioned by a rationality or discourse that operates in a distance from the actual process of interaction for the situation. Rather a (de)constructive methodological pluralistic framework accepts that the intervener is just another (in)dividual who networks in the (con)text and is there as a creative participant who attempts to differentiate, translate, and stabilise connections relative to his own self-organisation. This offers, not a detached version multi-methodology where actions of the participants involve validity claims of truth, rightness, truthfulness, or axiological claims of effectiveness, morality, and ethicality, but rather we recognise that a (de)constructive methodology is offering a paradigmatic shift that embodies the intervener in the situation and accepts that both are subject to change. Therefore, all claims about the status of the methodology are practiced in terms of ontological, epistemological, praxeological, and axiological terms within the (con)text.

At this point, it is important to make clear that a multi-methodology of this type consists a '*virtual paradigm*' within a (con)text, which is under continuous basis of change. Following

(Midgley, 2000, p. 255), we argue that *"there are always to be tensions and discontinuities between different aspects of it that have been introduced at different times under different circumstances".* Therefore, a (de)constructive multi-methodological device can only be described as a 'fragmentary whole', which closely resembles our theoretical reflections about the status of knowledge and knowledge production and have been presented through the paradoxical concept of the representation of the personal, the social, and the material by the metaphor of a Klein surface. Multi-methodology, as an 'entity', in (de)construction is under a perpetual situation of differentiation, translation and stabilisation. This means that the role of (in)dividuals, who creatively collaborate in a (con)text, is to maintain epistemological and ontological coherence (construction) and at the same time introduce the ways that, by interacting in a (con)text, differentiation for the incorporation of plurality is also established. This, of course, leads us to understand that the process of (de)construction will potentially have the capacity to become a regressive process that continuously reflects upon the conceptual methods that are used to maintain coherence. Obviously, the role of (de)construction is to provide the means for understanding that maintaining the right balance between coherence and differentiation is the necessary but also impossible task. As it has been presented, the only way to overcome this aporetic character of simultaneously interacting and maintaining meaningful communication and collaboration is by introducing strategies that explore both the foundations of our theoretical background and practical everyday performance, and also provide the necessary means to be critical about the 'boundaries' that are posed by (con)textual language. To conclude, it is clear that the discontinuities that have been posed by the logocentric philosophies of the past, either towards absolute monism or pluralism, as well as, correlationism, are replaced by systemic pluralistic and contextualised theories of understanding reality.

8 Summary and Conclusions

This thesis explores a range of contiguous issues in ontology, epistemology, philosophy, language, and psychoanalysis for developing an ontological device towards the understanding of interaction in communicative and collaborative contexts of heterogeneous (in)dividuals. It marks a further stage in the authors' project of developing an approach that would point a way of understanding the various dilemmas and dichotomies bequeathed by old-style positivist, modernist and the radical postmodern theories and thus, propose an alternative way of understanding reality, and gaining knowledge about it through a continuum of interaction. The theoretical approach, presented in this thesis, will potentially lead us to new philosophical inquiry. We argue that our aim is not to solve historically unresolved problems in a teleological manner, but to understand them through identifying ways to pluralistically coexist with them by increasing our capacity towards articulating new non-logocentric practice of inquiry.

Throughout this thesis we attempted to provide a thorough review of the major philosophical tenets of our age regarding the ways that knowledge constitution leads us to the understanding of interaction, communication, and collaboration. By critically observing them, and with a purpose to identify their main competing ideologies, our aim was to reverse this assumption and outline an ontological critical framework that places knowledge at the centre of interaction, while interaction remains closely related to it. This type of knowledge is not the absolute positivistic knowledge, but a rational and socially determined knowledge that is fragmented but still continuous and important for the development of our society and culture.

As it has been suggested, this type of interaction, through an ontological contextualisation of the personal, the social, and the material, reconfigures the determination of theory and knowledge in terms of a transitive and circular theorisation of reality between the foundational and the reflexive paradigmatic narratives that emerge in every historical era. In comparison to the traditional models of determinism, the proposed framework of (de)construction is never fully achieved as an actual reality, but remains as a symbolic process that attempts to 'ground' representational speculation in knowledge and everyday practice. Of course, this is not a simplistic monist formulation of understanding reality and developing knowledge through interaction. What is proposed in this framework, is that non-deterministic collaborative interaction consists to a continuous development of quasi-representational means towards describing reality. Therefore, by contrasting the practices of objective and hermeneutic empiricism, we propose a speculative ontological framework that provides us with a reflexive understanding of knowledge. We support that this framework succeeds to provide the means towards a dialectical conception of interaction through the analysis of the (in)dividual, the (con)text - where an interactive activity is taking place -, the process of the activity itself, as well as to include in the (con)text the metaphysically desirable final goal.

In reflecting upon possible future research and application directions for the theories and methods reviewed in this thesis, the scope is both diverse and far-reaching. The (de)constructive framework and the proposed multi-methodology can be extended and applied in socio-technical realms of human activity that include, collaborative design and collective networks of design practice, mass-collaboration in online communities, collaborative virtual environments, organisational contexts, and contexts of social interaction etc.

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List of publications

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Glossary

Agency: the acting subject that invests choice in the action.

Agent: the subject (agent) who acts or is the (often hypothetical) basis of an outcome. Agent is often loosely related to causes and effects, but he/she/it carries part of the causal correlation.

Analogy (Analogic): Structural relation whereby a form replaces another that is similar in form, function, or use.

Axiology: Is the means of identifying and studying the value of knowledge, things and situations in the lifeworld. (Cf. ontology, epistemology, praxeology)

(con)text: can be defined as an observed system or a network of dynamic relationships and processes that occur among dissipative structures and the context of the network itself. The (con)text has a unified dual character; it is being observed (by an observer) as a 'text' or a system and, at the same time, provides to this observer the grounds for observation. A (con)text's actual existence is not necessarily established by the observation, and it well may have happened because of other 'unknown causal' relationships independent of any possible observation.

Code: a structural system. With regard to signs, it is a system in which signs reveal a specific syntagmatic, paradigmatic, and analogic architecture.

Copernican revolution (in Kantian philosophy): in astronomy, the theory that the earth revolves around the sun; in philosophy, the (analogous) theory that the subject of knowledge does not remain at rest, but revolves around (i.e., actively deter-mines certain aspects of) the object. Thus, the formal characteristics of the empirical world (i.e., space and time and the categories) are there only because the subject's mind puts them there, transcendentally.

Choice: the ability of free will to make/perform a change.

Dasein: a Heidegger's notion to describe a form of existence that self-conscious human beings uniquely possess.

Desire: Michel Foucault writes in the introduction, "...Anti-Œdipus is an introduction to the nonfascist life."[1] Where capitalist society trains us to believe that desire equals lack and that the only way to meet our desires is to consume, Anti-Œdipus, has a different take: desire does not come from lack, as in the Freudian understanding. On the contrary, desire is a productive force. "It is not a theater, but a factory". The opposition to the notion of lack is one of the main criticisms Deleuze and Guattari make both to Freud and Marxism. Desire is a productive, real force — whereas psychoanalysis limits desire to imaginary fantasies (Deleuze & Guattari, 1972).

Downward causation: an approach that is related to semiotic representationism and holds that the upper levels of an argument or a agency limit and control its foundations {see §5.2.5}.

Epiphenomenon: is called a phenomenon that can be described in terms that do not depend on the underlying phenomena that bring it about. It is considered a secondary phenomenon that is a by-product of another phenomenon.

Firstness: in Peircean logic, first level of meaning, derived from bodily and sensory processes. (Cf. Secondness, Thirdness)

Jouissance: A French word which derives from the verb '*jouir*' meaning to have pleasure in, to enjoy, to appreciate, to savour; with a secondary meaning, as in English, of having rights and pleasures in the use of, as in the phrases "she enjoyed good health", "she enjoyed a considerable fortune", and "all citizens enjoy the right of freedom of expression". The derived noun, jouissance, has three current meanings in French: it signifies an extreme or deep pleasure; it signifies sexual orgasm; and in law, it signifies having the right to use something, as in the phrase '*avoir la jouissance de quelque chose*'. The word becomes relevant to cultural and literary studies through its usage by the psychoanalyst Jacques Lacan in his seminar of 1959-1960 *The Ethics of Psychoanalysis* (Lacan, 1992), *to signify the condition or bliss, arrival, merging with the other*, which can be associated with orgasm but also the obtention of any particularly desired object or condition. Jouissance, for Lacan, *is not a purely pleasurable experience but arises through augmenting sensation to a point of discomfort* (as in the sexual act, where the cry of passion is at times indistinguishable from the cry of pain), or as in running a marathon. Such experiences, as Freud recognised in his essay "Beyond the Pleasure Principle"(Freud, 1920), seem to come close to death, and in Freud's theory imply an urge to regress to the inorganic state that preceded life. For Lacan, on the other hand, jouissance seems to imply a desire to abolish the condition of lack (la manque) to which we are condemned by our acceptance of the signs of the symbolic order in place of the Real (Robert, 2004).

Icon: in Peircean logic, a sign in which the signifier has a direct (non-arbitrary), simulative connection to its signified or referent. (Cf. index, symbol)

Immanence: it means to 'remain within' and is related to the philosophical and metaphysical theories that deal with the possibility of presence and absence. In particular, traditional theories of immanence support that there exists some metaphysical, divine essence in and through all aspects of the material world. The notion 'immanent' is used in contradistinction to the notions of 'metaphysical' and 'transcendental' which refer to what is existent beyond the limits of lifeworld and experience. Therefore, for pantheists (i.e., Spinozists), immanent is something that - appears - to exist in everything in this world while for Kantians immanent is that which belongs in the sphere of experience or is a product of experience. The doctrine of immanence is a philosophical tradition of idealism that supports that everything that exists is bound by the limits of experience.

Incommensurability: Term introduced by Feyerabend and Kuhn to detect the connection between paradigms that happen during a scientific revolution. Paradigms before and after the revolution are considered incommensurable primarily because there is no direct way to translate the terms of the old paradigm to the new one. The basic premise behind the notion of incommensurability is that there is no language which can translate the old theory to the new theory without a loss. This means that two theories that emerged in

different paradigmatic eras have different '*lexical structures*' that cannot be matched (Psillos, 2007).

Index: in Peircean logic, a sign in which the signifier has an existential connection to its signified or referent (i.e., the sign indicates that something 'exists' somewhere in time and/or space) (Cf. icon, symbol)

(in)dividual: is a dynamic symbolic entity that 'do things' or participates in a (con)text; observed as symbolic processes. The (in)dividuals in the (de)constructive ontological framework can be categorised in terms of their subjective agencies (when the focal level is at the level of the individual), and in terms of their mode of interaction and participation processes in the (con)text (when the focal level is at the level of interaction in the (con)text).

Infinite regression: In *philosophy* and *logic,* infinite regression is considered a causal relationship transmitted through an indefinite number of terms in a series, with no term that begins the causal chain.

Kehre: (*die kehre:* the turning) In Heidegger's philosophy there is a reversal that symbolises two different major eras of Heideger's different interpretations of *Dasein* (In an essay on "Heidegger and Theology" of 1993, John Caputo describes three, and perhaps even four, turns (Philipse, 1998, chap. 3)). Other studies (Kerchner, Li, & Zhuo, 1999) of these eras support that the horizon of time and the analytic of Dasein never really disappear from Heidegger's later thinking, and propose that the relationship between the earlier and later Heidegger be re-examined. This re-examination takes the form of accepting that far from the 'turning' representing a fracture, where Heidegger abandons the existential-temporal analytic of Dasein in favour of an attempt to think only being (das Sein) as such, the 'turning' represents the point of unity in Heidegger's work. Thus, present a passage of unity in Heideggerian thinking that shows how Dasein and being 'belong together' in 'the event' (*das Ereignis*).

Logocentrism and logocentricity: is the assumption that words can unproblematically communicate meanings present in individual's minds such that the listener, or reader, receives them in the same way as the speaker / hearer intended. Words and meanings are therefore considered to have an internal stability. This is a standard assumption of discourse in Western culture, but one that has come under attack from the deconstructionist movement. Jacques Derrida in particular regards this as an unsustainable position to adopt, on the basis that words always carry traces of previous meanings, as well as suggesting other words which sound similar to the one being used.

Networked: Is a concept that denotes interactive and communicative activities with and within a group or system.

Noumenon: the Kantian transcendental object. The term 'negative noumenon' refers only to the recognition of some-thing which is not an object of sensible intuition, while 'positive noumenon' refers to the (quite mistaken) attempt to know such a thing as an empirical object. These two terms are sometimes used loosely as synonyms for 'transcendental object' and 'thing in itself', respectively. (Cf. thing in itself, phenomenon.)

Ontology: is concerned with the study of the nature of the real and being. (Cf. axiology, epistemology, praxeology)

Paradigm (social sciences): A paradigm is a fairly general collection of philosophical positions that characterise the nature of possible research and intervention. Paradigms can be distinguished in terms of four philosophical questions: ontology, epistemology, praxeology, and axiology {see §2.2.1}.

Paradigmatic: in semiotics, structural relation between signs that keeps them distinct and therefore recognizable. Paradigmatic structure involves distinctiveness and selectability.

Proprioception: is a third distinct sensory modality that provides feedback solely on the status of the body internally. It is the sense that indicates whether the body is moving with required effort, as well as where the various parts of the body are located in relation to each other. Proprioception and kinaesthesia are seen as interrelated and there is considerable disagreement regarding the definition of these terms.

Praxeology: is the study of practices and actions. The means of knowing. (Cf. ontology, epistemology, axiology)

Secondness: in Peircean logic, the second level of meaning, derived from verbal processes. (Cf. Firstness, Thirdness)

Symbol: in Peircean logic, a sign that represents a referent through cultural convention. (Cf. index, icon)

Syntagm (syntagmatic): structural relation that combines signs in code-specific ways. (Remember that syntax is the syntagmatic structure in language.) Syntagmatic structure involves combination and organisation.

Technique: is a specific activity that has a clear and well-defined purpose within the context of a methodology. If methodology tells us '*what'* to do then technique deals with *'how'* to do it. Therefore, methodology specifies what type of activities should be undertaken, and the techniques are particular ways of performing these activities. Generally each methodology ('whats') has a number of possible techniques ('hows').

Thing in itself (Kantian: 'ding an sich'): is an actual object and its properties that exist in the un-symbolised real apart from all the conditions under which a subject can gain knowledge of it. Such objects are considered independent of any observer and thus are not represented in knowledge (unknowable). Sometimes this is loosely used as synonym to the 'noumenon' **Greek: 'νούμενον'** (Cf. Noumenon)

Thirdness: in Peircean logic, the third level of meaning, derived from symbolic processes. (Cf. Firstness, Secondness)