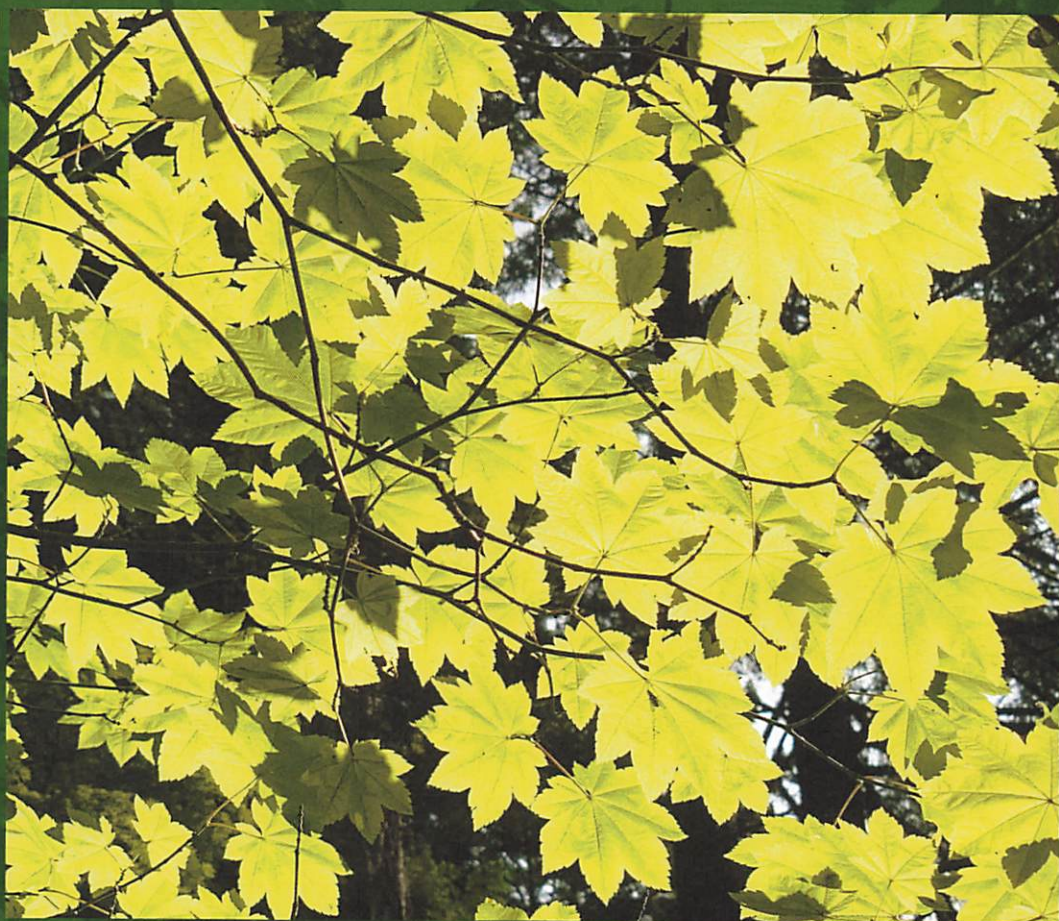


CYBERNETICS & HUMAN KNOWING

a journal of second-order cybernetics
autopoiesis and cybersemiotics

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HUMBERTO MATURANA:
REFLECTIONS ON BRINGING FORTH WORLDS

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Humberto Maturana: Reflections on Bringing Forth Worlds

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The Artist for this issue is Pille Bunnell. Full color art at www.chkjournal.com.

Cover Art

Bunnell, Pille. (2021). *Luminous Consequence of Autopoiesis*. Photograph.

Maturana's Path of Objectivity-in-Parathesis

Raul Espejo¹

This article discusses the explanatory paths that Maturana calls objectivity-without-parathesis, or the path of transcendental objectivity, and the path of objectivity-in-parathesis, or the path of constituted objectivity (Maturana, 1988). I relate these views to Black Box descriptions and operational descriptions of organizational systems (Espejo & Reyes, 2011). The most significant implication of this distinction is that while Black Box descriptions are focused on the relational complexity of the social system with its environment, the operational descriptions are focused on the complexity of the relationships producing these organizational systems from the multiple stakeholders' viewpoints, accounting for aspects such as respect, trust, collaboration, cooperation and in more general terms to the emotions of love constituting these relationships. It is argued that this second-order cybernetics perspective is complementary to the first order, Black Box perspective, and adds to our understanding of Ashby's requisite variety (Ashby, 1964) and Beer's viable system model (Beer, 1979).

Keywords: Maturana; objectivity-without-parathesis; objectivity-in-parathesis; organizational systems; viable system model; requisite variety

Introduction

In this article I explore from the perspective of organizational cybernetics Maturana's two explanatory paths, namely the transcendental ontologies of *Objectivity*, that is *objectivity-without-paratheses*, and *(Objectivity)*, that is, *objectivity-in-parathesis* (Maturana, 1988). In my work I relate these paths to a Black Box description and to an Operational description of organizational systems respectively (Espejo & Reyes, 2011). The most significant implication of this distinction is that the Black Box, or Objectivity description is focused on the complexity of outputs to the environment starting from the organization's transformation of its inputs, while the operational description, or *(Objectivity)* is focused on the complexity of the relationships between its multiple internal and external stakeholders producing the outcomes of the organizational system from its relationships while accounting for aspects such as respect, trust, collaboration, and cooperation. In more general terms this entails accounting for the emotion of love, or its lack, in the constitution of these relationships. This is a second-order cybernetic perspective that is complementary to the first order Black Box perspective, and it helps to developed a significantly more comprehensive understanding of conversations in social systems.

My discussions are focused on people and organizational systems and are influenced in general by Maturana's work and his view that observers are living

1. Email: r.espejo@syncho.org

systems as well as emotional and conversational beings whose cognitive abilities are altered by their biology and languaging, Further, organizational systems are constituted by observers; “everything said is said by an observer to another observer that could be him- or herself” (Maturana, 1988, p. 28).

My arguments focus on two of his articles: “Reality: The Search for Objectivity or the Quest for a Compelling Argument” (Maturana, 1988) and “Autopoiesis, Structural Coupling and Cognition: A History of These and Other Notions in the Biology of cognition” (Maturana, 2002). The first article gives, from my perspective, an insight about his ontological and epistemological views of people contributing to the constitution of social systems and the second helps to understand the concepts of organization, structure, relationships and identity in social systems rather than in biological systems. However, as Maturana has said, organizations are social systems and not living systems, though many people have tried to apply Maturana’s original concepts about living systems to organizations.

In social systems the complexity of the operational domain depends largely on the complexity of autonomy, cognition, and communications, all of which are aspects of the *structural couplings* among the participants. The complexity of this domain is orders of magnitude larger than that of people’s distinctions in their *informational domain*, that is, in the domain of referring to these processes.² For effective participation in change processes we need to take into account the complexity of structural couplings (Maturana, 2002). I emphasize that because people operate in networks, the operational domain of their actions needs to account for the complexity of their interactions.

Maturana states that notions such as complexity and chaos are evocative metaphors for the reflections of an observer and argues that these notions do not reveal the processes involved in the constitution of a social system. However, I argue that being aware of sources of complexity enables this system to configure its interactions. For a social system, *structural recursion* is replication of its structure within the contained autonomous units (Beer, 1979). This recursion makes it possible for the system to cope with proliferating environmental complexity. In other words, the components of a social system with structural recursion are autonomous sub-systems each structurally determined and operationally closed, as described in Figure 1.

Not recognizing structural recursion implies failure to see the architecture of social systems and, from the perspective of an observer, implies sticking to a transcendental ontology, which fails to recognize the components’ autonomy. In a phenomenological sense, a complex structure determined system is generated as the system’s components respond with autonomy to the environment’s larger number of possible states. I relate this complexity to Ashby’s concept of variety: the number of possible states of a situation, which he offered as a measure of complexity (Ashby, 1964).

2. The distinction between operational and informational domains recurs throughout the arguments of this paper (Espejo, 2020).

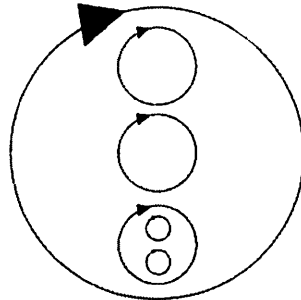


Figure 1. Structural Recursion (adapted from Beer, 1979, p. 315). Self-organizing autonomous organizations are indicated by the circular arrows. Smaller autonomous organizations are shown as viable entities within the larger autonomous organization.

From the perspective of an observer, autonomy relates to (Objectivity) rather than Objectivity. People who conceive their world according to Objectivity get no benefit from observing the structural recursion of autonomous components in the organizational system. Thus, my view is that complexity is more than an evocative metaphor; it is a necessity for structure determined systems in demanding environments. Variety is central to structural determination and to the structural couplings of organizational systems, and requisite variety is the amount necessary for a viable response in a complex environment. The organization's relationships of legitimation, domination, and signification (Espejo et al., 1996, p. 70) constitute their bodyhood and make requisite variety a central concept in the formation of its operational domain, as is discussed later in the paper.

Emotional upheavals that may lead to the mutual destruction of participants in a cognitive disagreement is an inevitable consequence of their operation in the explanatory path of Objectivity; that is, in the path of not seeing participants as autonomous beings in need of mutual respect. Disagreements in this explanatory path constitutively entail mutual negation and produce existential threats. The only way to escape such an emotional trap is to move to the explanatory path of (Objectivity), which includes autonomy, conversations and correction of relational variety imbalances. Recognition of the other cannot take place through reason, it can only take place through stable conversations; that is, through languaging and emotioning in the mutual acceptance of each other.

Organizations Arise Through Languaging Relationships

Language is a manner of living together in a flow of coordination of coordinations of consensual behaviors, or doings, that arise in a history of living in the collaboration of doing things together (Maturana, 2002, p. 24). People may language effectively in their *structural coupling* if they possess the necessary complexity or variety. The

continuous interlacing of coordination of coordinations of doings with emotions is what Maturana calls conversations. Organizational systems emerge from networks of these conversations.

Figure 2 shows the coordination of actions of two people sharing the same music as a common source (Espejo, et al., 1996). This is a dance in the operational domain of their interactions. They learn in these interactions, and possibly they coordinate this coordination of their actions if they exchange information about what they are doing and how to do it. If they language this “how to do it,” and if their exchanges are braided by the mutual emotion of acceptance, they are in a conversation. On the other hand, if they are good dancers and share the music, they don’t need to coordinate their coordination of actions: It just happens through consensual coordination. The structural coupling happens without information exchanges and the dancers express their knowledge in their adequate performance. This kind of communication—without explicit recourse to language between the actors sharing a common context—is most powerful in managing complexity in organizational systems; Conant (1979) calls it *communications without a channel*.

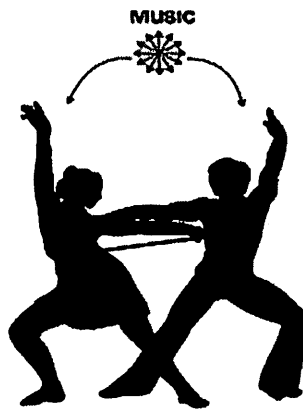


Figure 2 Two dancers coordinating by sharing music as a common changing environment triggering their consensual coordinations. This is referred to as “communications without a channel” (Espejo et al., 1996, p. 73)

If what takes place along a particular course of recurrent interactions between two or more living systems is the expansion of an initial domain of consensual co-ordination of actions, without language between them, in Maturana’s terms those living systems have established what he calls a domain of “consensual co-ordination of actions” (Maturana, 1988, p. 33). Following Conant (1979), I relate this domain of consensual coordination to the coordination of actions (without channel capacity) in the recurrent interactions of the living systems. All that is needed for these systems is that at their first encounter they have the necessary structural configuration (i.e., resources and relations) for recurrent interactions between them to take place. However only if

structural plasticity in the domain of their interactions is present, and the initial structure allows them to conserve organization and adaptation can their initial consensual coordinations become a domain of recurrent interactions.

Towards a Path of Objectivity-in-Parenthesis

As already explained, related to living in language, Maturana refers to two ontological domains (Maturana, 1988); the domain of constitutive ontologies (Objectivity) and the domain of transcendental ontologies Objectivity (Figure 3).

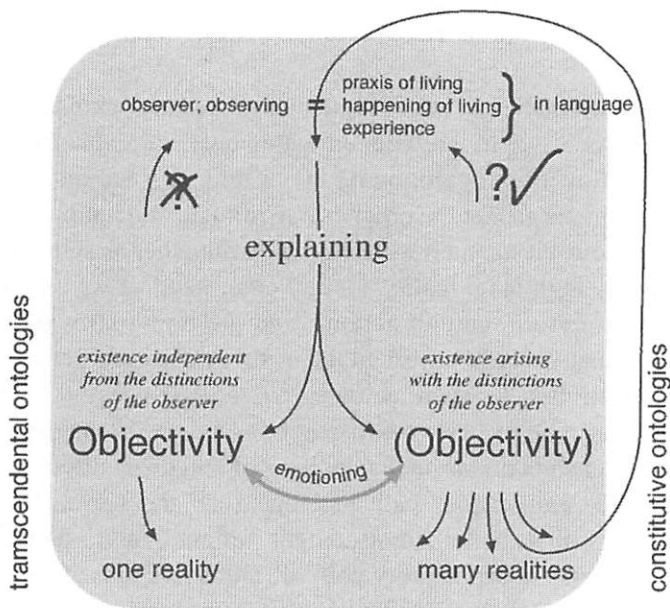


Figure 3. Ontological Domains as Drawn by Maturana in Many Workshops
(As redrawn by P. Bunnell in *CHK*, 2004. Original published in Maturana, 1988, p. 32)

An observer who follows the explanatory path of (Objectivity) realizes that he or she lives in a *multiversa* of “many different, equally legitimate, but not equally desirable, explanatory realities, and that in it an explanatory disagreement is an invitation to a responsible reflection of coexistence, and not an irresponsible negation of the other” (Maturana, 1988, pp. 31–32). In understanding this the observer also realizes that other observers are also autonomous beings who live in different, yet legitimate realities.

An observer in the domain of transcendental ontologies claims explanations are validated by their reference to entities which exist independently of its actions; matter, energy, gravity and so on. In this ontology people disagree about reality, thinking their reality is the right one and other people are wrong.

Whether any particular observer operates in either the transcendental or the constitutive ontologies depend on whether or not he/she accepts different domains of actions and cognition as valid. The acceptance, in turn, is grounded in an emotional choice of either trust or mistrust and the attendant desire for certitude. Whenever the observer operates assuming Objectivity, there is an implicit operational acceptance of any observation as a representation of Reality. It is only when the observer accepts the question about how we explain biological or social phenomena (Figure 3) that the possibility of two explanatory paths, namely of (Objectivity) and Objectivity appear, and it is only then that it is possible for the observer to reflect upon their epistemological and ontological implications. Whether the observer follows one explanatory path or the other, however, does not depend on a rational argument—it depends on preferences and inner disposition to implicitly or explicitly accept and take one or the other of these two possible starting conditions; Objectivity or (Objectivity).

In daily life, we normally move unconsciously from one explanatory path to the other in the manner we argue to validate our statements and explanations, and we do this according to the flow of our emotioning in our interpersonal relations and desires. Thus, if in a discussion we accept the other as a legitimate and autonomous individual, and we don't impose our views, then we are treating the other as someone operating in a different but equally legitimate reality. On the other hand, if we assert our position, or force the other to perform certain actions, and are doing so with the implicit or explicit justification that we have access to the truth, then we are acting according to a transcendental Objectivity. In such actions, we are denying the autonomy and legitimacy of the other. The reality we live depends on the explanatory path we adopt, and that this in turn depends on our understanding of and disposition to (Objectivity).

As a result, in the explanatory path of Objectivity the search for reality is the search for conditions that make an argument rational, and, hence, undeniable. However, an observer in the explanatory path of (Objectivity) is aware that, although emotions do not determine the operational coherences of any domain of reality, they determine the domain of operational coherences of rational arguments. It is apparent that when an observer, in a position of authority, shouts to someone he or she is likely to be operating in a path of Objectivity.

In the discussion of organizational systems, because of structural determination, I assume observers are aware of Objectivity and (Objectivity). However, it is apparent that people in organizations often follow the path of Objectivity, The two paths trigger different organizational forms. I am proposing a further possibility, that is to operate in the confluence of these two paths as this enables the humane operation of complex organizations. Unfortunately, a humane operation is not the most common. In daily life we usually operate in the explanatory path of Objectivity, which in most practical situations of moving from one place to another or doing routine tasks, is not only acceptable but expedient. However as a consequence we easily become blind to the importance of our emotioning in shifting us between the two paths, and as a consequence easily create, and then become trapped in hierarchical structures, where

rationality supersedes respect, acceptance and appreciation for the others. It is only as we become aware of the biology and emotions of the observer and operate in the explanatory path of (Objectivity), that we become aware that every rational system in which we operate is grounded in basic premises that we adopt according to our emotioning. Respect, acceptance and more generally as proposed by Maturana, love, is the emotion that constitutes social phenomena. Respect, acceptance, and love are emotions that specify the domain of actions in which living systems co-ordinate their actions and develop their autonomy (Maturana, 1988).

Organizational Systems Are Created by Human Beings in Conversation Networks

Any network of conversations in which people operate in the mutual acceptance of each other may constitute, through their relationships, a social system. Thus a family, a community, a political party, a sports group or a cohesive group of friends may all be systems of co-ordinations of actions in language, and as such comprise networks of conversations realizing social systems. The richness and resilience of such networks depends on how the people involved operate with requisite variety, and do so in mutual acceptance. As a result, and regardless of our awareness of this situation, we move in daily life through networks of conversations, entering and leaving social systems according to whether, in the flow of languaging and emotioning, our behavior entails accepting or rejecting coexistence in mutual acceptance.

As claimed in the introduction, the explanatory path of Objectivity corresponds to a Black Box (BB) description of an organization whereas the path of (Objectivity) corresponds to an operational description. The BB and operational domains of coordination of actions affect our emotional dispositions and the way we construct our interactions with others and thereby create domains of mutual acceptance. In the BB domain we don't recognize shared domains, we just operate in different domains. On the other hand, in the operational domain an observer may claim that social phenomena are taking place when two or more people, in recurrent interactions, follow an operational course of mutual acceptance thus forming a social network. It entails mutual acceptance and constitutes social phenomena (Maturana, 1988).

Maturana's arguments about Objectivity and (Objectivity) are particularly useful for explaining aspects of autonomy and complexity in organizational systems. They are not either-or arguments, together they are relevant to the constitution of organizational systems.

People who understand their contribution to organizations in a mood of Objectivity assume that their understanding of the situation defines a transcendental reality that they discern while the views and emotions of others might be considered to be misleading or wrong. This stance is a characteristic of people operating in a hierarchical organization where the operations are made efficient through restricting the autonomy of workers. In this stance bosses in effect are defining the reality of the organization and the tendency will be to take the purposes of the organization as those

visualized and defined by these bosses. The role of conversations and inclusion of others' perspectives and even insights in the definition of these purposes is likely to be minimized and the organization is likely to be seen as a trivial machine of inputs and outputs (Espejo, 1994). In other words, Objectivity will overemphasize unilateral power. People with this perspective, even if they believe otherwise, are describing organizations as Black Boxes. While this is unlikely to be a completely definitory description, it provides a common description of the sort we often encounter in daily life.

On the other hand, if people understand organizations in a stance dominated by (Objectivity) they will recognize the organization as constituted by conversations of mutual respect, in an emotion of love, which I have called an *operational description of organizations*. When the constitution of an organization is dominated by (Objectivity), people do not impose their purposes but construct them through conversations. I illustrate this form of organizational constitution later in this article.

It is in this sense that I'm making a connection between Maturana's ontological domains (Figure 3) and Beer's viable system model (VSM; Figure 5, below). Most significantly, central to my argument is that Beer's views about autonomy and complexity are strengthened through Maturana's ontological views.

Input-output (BB) descriptions (Figure 4) of social systems emphasize the power of information in organizational adjustments rather than the power of communication. Communication entails structural coupling among structurally determined systems which thus results in change and adaptation. Input-output (BB) descriptions can be related to first-order cybernetics. Operational descriptions, on the other hand, can be related to second-order cybernetics and to an appreciation of autonomy and the complexity of embodied relationships. Both BB and operational descriptions are necessary and complementary. The first puts the emphasis in the environmental constraints that orient how an organization handles complexity. The second puts the emphasis in people's conversations, language and emotions, that constitute the purposes of the organization. The first is about inputs and outputs, the second is about relationships. I see in this distinction the epistemological and ontological contributions of Maturana to social understanding of organizations as embodied processes. In what follows I will illustrate this complementarity with reference to Beer's VSM.

The BB description is focused on input-output requirements for managing the complexity of an organizational system. Espejo (2020) gives details of the structural requirements for managing the complexity of a situation with requisite variety. However, in organizational systems, these requirements should be the outcome of a constituted ontology of conversations of (Objectivity). This is the operational description of a system focused on relationships, in which people contribute to its constitution through language, emotioning and, following Maturana, through their braiding in conversations.

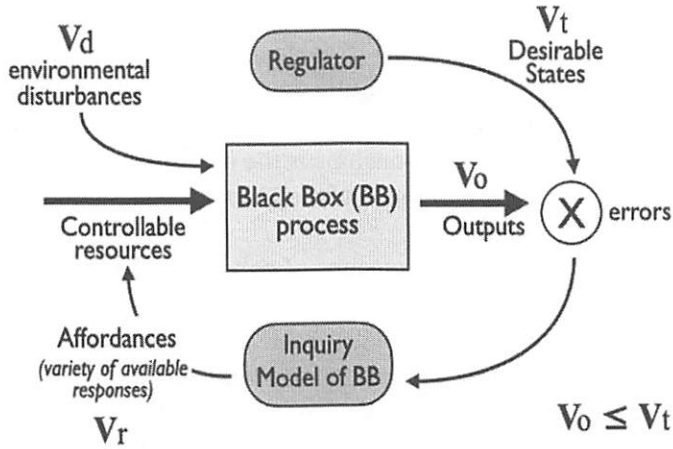


Figure 4. Management of complexity and requisite variety as represented by a Black Box description of an organizational system (after Espejo, 2022). V stands for variety and $V_o \leq V_t$, is a condition for requisite variety, that is, the variety of outputs, should be less/equal than the variety of desirable states.

In the operational description the complexity of the relationships shown in Figure 5, and discussed below, are the outcome of (Objectivity), and arise from multiple perspectives accordingly. These relationships define the bodyhood of the organizational system.

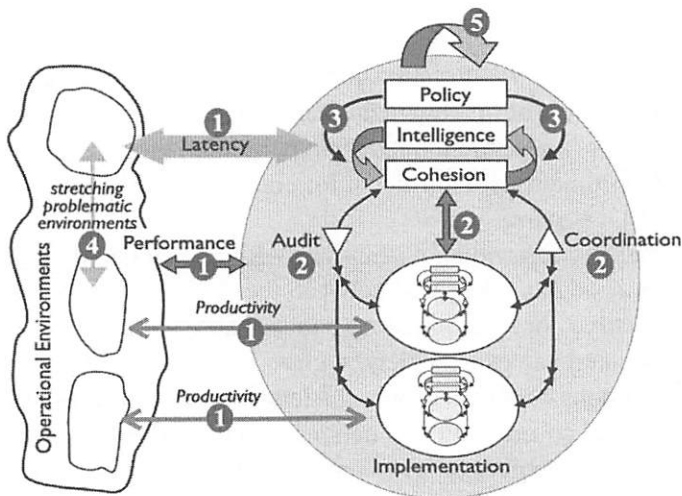


Figure 5. An adaptation of Beer's VSM with a focus on relationships; see text for an explication of the numbered relationship for creating, regulating and producing an organizational system's purposes (after Espejo 2008, 2022).

1. *Relationships of Performance*—Relationships of performance are knowledge embodied outcomes observed by observers who distinguish the organizational system behaving more or less adequately, with coherence, in its structural couplings with the environment. To a large degree performance is bodyhood driven; it is based on a history of structural couplings. Productivity is the outcome of actors' latency relationships of the system with stakeholders offering future possibilities and productivity relationships is the outcome of conversations between system's actors and external stakeholders focused on today's possibilities.
2. *Relationships of Cohesion*—Relationships of cohesion are those conserving cohesion between all the actors constituting the system (e.g. policy makers, experts, administrators, employees in general). In the extreme the governance of these relationships may follow conversations imposing hierarchical relationships of Objectivity. Alternatively, they may encourage relationships grounded in (Objectivity), thus supporting autonomy at each level of the organization. These are conversational processes for building trust and coordination of actions, far beyond the traditional executive information systems.
3. *Relationships of Policy Making*—Relationships of policy making take place between policy makers, inside actors and outside agents. Inside actors are focused on current operations inside the system (cohesion actors) and outside agents are focused onto the future (intelligence actors). The policy-makers' role is orchestrating conversations between both viewpoints in order to create desirable system purposes and values. These actors should recognize which conversations are necessary for the creation of values and purposes. More than defining policies, a key role of policy makers is working out who are the people that should participate in conversation policy debates. This is illustrated further in the section below.
4. *Relationships of Inclusion*—Relationships of inclusion take place between policy makers and the owners of the organizational system, that is, the people to whom these policy makers are accountable for. In particular, these relationships of inclusion and legitimacy are significant for constructing the social ownership of the organizational system.
5. *Relationships of Organizational Citizenship*—Relationships of organizational citizenship are those that take place between the system actors and those providing normative context to their activities. These are people who act as guardians of societal values in society, such as families, community, political parties, sports groups or even a group of friends. These relationships provide a context that enables co-ordination of actions in language. Through their emotional intertwining they create networks of conversations to the extent that the people involved operate in mutual acceptance. We move in daily life through networks of conversations, entering and leaving social systems according to whether the flow of languaging and emotioning entails accepting or rejecting coexistence in mutual

acceptance. Bringing this dynamic specifically into the operation of an organizational system arises through relationships of organizational citizenship.

Production of Organizational Purposes Through Stakeholder Relationships³

As a conclusion, I want to discuss further relationships of policy making (Relationship 3 in Figure 5) to illustrate the production of purposes and the implication of this production in the boundaries of organizations.

Rather than a single viewpoint defining the purposes of the social system, in Maturana's paradigm clarification of purposes follows the idea of (Objectivity). Clarification of a system's purposes requires more than just statements about its missions and goals. Rather it requires correcting variety imbalances between the views of external (environmental) and internal (organizational system) stakeholders, creating stable meanings through well-resourced and steered conversations between Policy, Intelligence and Cohesion as depicted in Figure 5.⁴ These are systemic functions necessary for an effective policy process. Central to all this is that policy is the outcome of conversation between people rather than a matter of unilateral statements.

Systems' purposes evolve from conversations. Leadership needs to manage the interactions between those contributing to these purposes. Among other aspects these conversations contribute reflexively to the clarification of their roles. Some stakeholders will contribute to producing the system's products and others to dealing with environmental stretching. Purposes emerge from steering value driven conversations such as the pursuit of truth, sharing of knowledge, freedom of thought, rigorous, reasoned arguments, listening to alternative views, the impact of own views on others, and commitment to ethics, such as rule of law, democracy, human dignity, human rights, good governance and sustainable development. These values, as adhered to by organizational leaders, are proposed as drivers for stakeholders' interactions. In the context of value driven conversation, stakeholders are in better disposition to contribute to balanced relationships towards creating systemic policies. Though conversations concerning values may be initially loose, they should contribute reflexively to the in-depth clarification of purposes. Indeed, in social systems, these conversations depend largely on consensual coordination based on structural determination and structural coupling and to a lesser degree in information.⁵ Those contributing to these processes will support through their reflexive interactions the production of the system's purposes (e.g. identity). An important role of policy makers is to balance these contributions.

Processes for the creation of policies should ground the system's development in the mechanism underpinning these conversations. Whatever the outcomes, these are grounded in correcting variety imbalances in conversations. Following Maturana, the

3. An application of this idea of purpose production to higher education is in Espejo and Holtham (in press).

4. This clarification requires variety balanced conversations between intelligence and cohesion viewpoints.

5. This is the distinction between operations and information used in different parts of this article

quality of these conversations, should be driven by a constitutive ontology of (Objectivity).

Though structural coupling may sound mechanical, it is a basic process that has the potential to enable people in conversation to coordinate their relationships and avoid unchecked controls and abuses of power. Policy interactions in organizations need to be driven by caring networks. These networks are necessary to embody a robust organization. A structure that prevents respectful and ethical interactions destroys what people think and do and is thus inadequate. Adequate structure, on the other hand, consist of recognizing that what each individual deserves is beyond unilateral statements of wishful thinking and should be the outcome of balanced conversations in the policy system (Espejo, 2022). Such a structure is encouraged by ethical considerations starting with policy makers, and from there expanding to integrating stakeholders in a manner that leads towards a collective of people sensitive to the system’s long term. In the end, fairness and quality emerge from properly regulated interactions, reflecting the values and purposes of the related people in a wider environmental context.

An implication of the above discussion is that the boundaries of an organizational system are the outcome of conversations and therefore emotional in nature. Naturally, stakeholders constitute varied networks of co-ordination of actions. This is reflected in the dashed circles of figure 6 below; indicating that the boundaries of an organizational system are fluid. This issue of *liquid boundaries* (Bauman, 2000) is developed in two of my papers (Espejo, 2008, 2020). In particular the 2020 paper offers a methodological extension of this fluidity, through enterprise complexity networks.

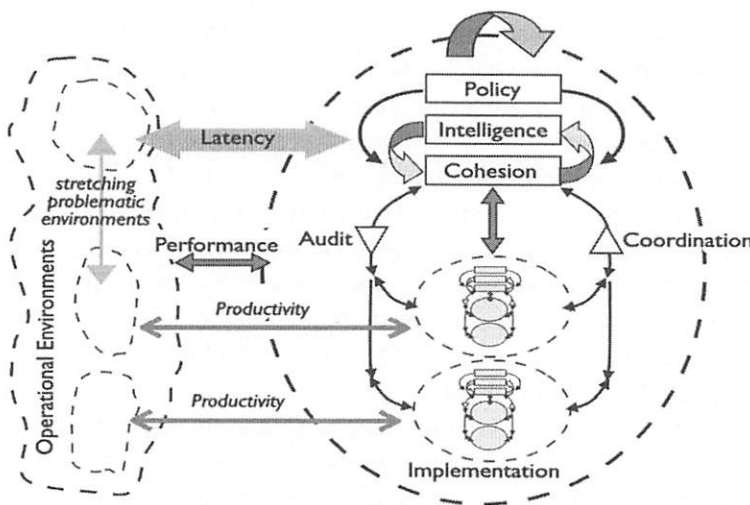


Figure 6. A network of enterprises embodied as a social system with liquid boundaries (after Espejo, 2008, 2020)

In summary, Maturana provides the foundations of his constitutive ontology in his paper of 1988. He argues that “a social system is a closed system that includes as members all those organisms that operate under the emotion of mutual acceptance in the realization of the network of co-ordination of actions that realizes it” (p. 70). My arguments about balanced interactions make explicit that they should be the outcome of (Objectivity), wherein multiversa are constituted based on language and emotions. And, unless participants overcome fragmentation, networks will fail to produce integrated outcomes, purposes and values, in which case they will have to accept rational arguments of objectivity and power. The issues that are considered to be of concern will be bounded by the limits determined by the transcendental reality of those in power. Thus, as Maturana would argue, boundaries of a social system appear in the behavior of its members as they include or exclude others from a particular network of co-ordination of actions. People usually justify this with rational arguments from the perspective of the explanatory path of Objectivity as a social boundary becomes explicit in language. Consequently conversations about purposes are far more effective than rational arguments as they enable correcting variety imbalances between actors for effective policy processes, and this requires managing emotions. The presence of emotions in our conversations make explicit that the boundaries of a particular social system require us to manage more than rational arguments.

This is where the rational underpinning of science, grounded in Objectivity becomes a difficult path to follow in policy processes. If the management fails to take into account adequate variety, then stakeholders, particularly leading ones will have to move out of the path of Objectivity into the path of (Objectivity) and take responsibility for their actions. If we are in the path of coexistence in (Objectivity), the situation is different because stakeholders will be increasingly aware of the many different domains of reality in which they operate, as well as of the emotional grounding of their ethical concerns. This is a situation where stakeholders will benefit by structuring their relevant situations from different cognitive domains; blending rational and emotional domains. Managing their interactions may benefit of the conversational tools as proposed by Gordon Pask, and others (Pask, 1979; Winograd & Flores, 1986; Scott, 2021). The many domains of reality or cognitive domains that we bring forth as we explain our praxis of living in the explanatory path of (Objectivity) appear as necessary to incorporate the benefits of Beer's, Maturana's, Pask's and also Flores's works.

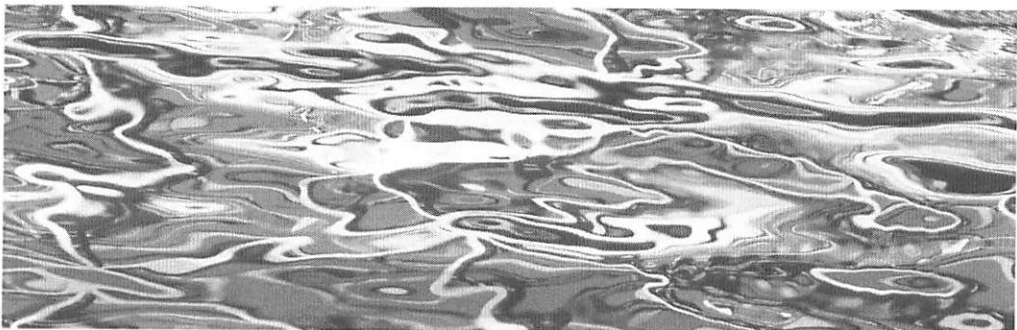
Let's bring forth organizational systems that support living and working together from the path of objectivity in parenthesis, the emotion of love, the power of conversations and the correcting of variety imbalances in their development and productivity

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Humberto Maturana: Reflections on Bringing Forth Worlds

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