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Abstract

Contemporary literature on dialogue focuses particularly on Bohmian dialogue. One argument may be the ability of this dialogue theory to match with modern communication tools, especially through Internet. Also, the major theme of Bohm theory, the open dialogue, has been developed technologically as an "open space" where all dialogues, whatever aims or subject, may possible.

This paper states that the dialogue processes differs in nature, and one particular process do not result from an arbitrary option. The foresight, for instance, does not consist in a dialogue related to one specific topic, whatever complex and extended might be. The dialogue, in this case, may be seen as a support action for the foresight activity, or as a *resource* which may offer solutions for sustaining it. This is a 'dialogue in' for the foresight, and the discussions may focus on various related themes: sustainability, science-society dialogue, environmental policy etc. The purpose of this dialogue is to reveal new meanings for 'foresight', as a second-order significant. Certainly, words like future, vision, forecast etc. may not be mentioned, but any loss in meaning: in fact, there is a third-order of signification for these words.

Dialogue might be also considered as an activity itself, even in relation with foresight. This is a 'dialogue about' the subject, which is concerned on a denotative meaning of the word: the dialogue will emphasize the connotations of the related words like future, vision, forecast etc. and the purpose is to negotiate a common meaning for the subject-word, foresight.

When a dialogue is an ongoing process, it creates stable communication structures, or dialogical groups. It is natural to consider the emergence of one group having a certain a priori purpose, even it appears accidentally. The word 'purpose' might refers to debate a subject, to reach an agreement or to explore the significations of one term. It is also natural to examine how adequate is the structure, and it might be expressed in two ways: how large should be the group, and how many time is necessary to reach the purposed objective.

Starting and sustaining dialogical structures depends strongly on nature of the activity to be supported by the dialogue, available resources and objectives. Foresight dialogue is, in fact, a "mix of dialogues" which proves the homogeneity of the field.

Keywords: dialogue, communication, semiotics, dialogue about, dialogue in, efficient dialogue, foresight ;JEL classification : A12, A14

Nature of dialogue

Etymologically, the word's origins are in Greek (diá = through, logos = word, speech), which mean "what can be revealed by words"; particularly, and more adequate, considers Bohm (Bohm, 1991), the translation of "logos" should be "meaning of the word". The basic concept on the nature of the *dialogue* reflects a "reciprocal conversation" between two or more persons, and this is the most usual sense of the word, scarcely modified since the ancient times.

1. When reproduced in writing, "dialogue" labels a form of literature for rhetorical, entertainment and instruction purposes. Historically, the technique of the dialogue in literature dates back to the Indian epic poem Mahabharata (6th century BC, and, probably, some of its older parts, 8th century BC). For the Mahabharata's author the dialogue is a *narrative support*, not very closed to the sense of "conversation". By the dialogue the author attempts to emphasize the explanations of the relationship of the individual to society and the world (the nature of the 'Self') and the workings of karma.

2. In Western European culture is Plato (c. 427 BC - c. 347 BC) who introduces dialogue as an independent form of literature and uses it systematically in his whole works (except the *Apology*). For Plato, the dialogue has a different signification than a simply "conversation".

In Plato's view, the dialogue is a *tool to reach the truth*, emphasizing the **gnoseologic** dimension of dialogue. This philosophical sense of "dialogue" is due to an explicit or implicit disagreement or ambiguity present in the theme of the dialogue, and the purpose of the dialogue is to eliminate it. The typical way is to ask the partner some questions on theme until a disagreement between disputed beliefs or hypothesis is revealed. Then the interlocutor has to see the impossibility and will try other hypothesis, which is again a subject of dialogue; the dialogue will end not necessary with a final resolution.

The Plato's dialogue structure is *argumentative*, as well as the opponent *learn* from the contact with the interlocutor. This is an adequate form to capture subtle nuances of the discourse and to impose viewpoints, and it appears to be the most important Plato's inheritance of the dialogue's meanings. The systematic use of the dialogue – sometimes as imaginary dialogues between peoples who never could meet together – in the philosophical literature (and not only) has a long tradition, from middle age to modern period[1].

3. The existentialism brings another view on the role of the dialogue, metaphorical and complex, strongly related to the human existence. Martin Bubber (1868-1965) places the dialogue in the centre of its philosophical system, but as an effective means of the ongoing conversation instead of a mode to reach any conclusion or to express viewpoint.

Bubber's dialogue is purely **ontological**. The author stresses that the premise of existence is *encounter*. The dialogue is, in his view, a *mode of consciousness, interaction*, and being through which an individual engages with other individuals, inanimate objects, and all reality in general.

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[1] Fontenelle (1683) and Fenelon (1712), for example, wrote the "Dialogues of the Dead", George Berkeley (1713) "Three Dialogues between Hylas and Philonous", Walter Savage Landor (1828) "Imaginary Conversations", etc.

Bubber explain his philosophy using words pair *Ich-Du* (dialogue) and *Ich-Es* (monologue) to categorize the dual modes through which an individual exists and actualizes that existence. *Ich-Du* is a relationship to describe the mutual, holistic existence of two beings. It is an authentic encounter, because one meets another individual in their real existence, where imagination and ideas do not play any role. *Ich-Es* is the opposite of *Ich-Du*, a relationship where peoples do not actually meet. In this relationship the peoples, objects etc. are conceptualized, and became mental representations, instead of real beings, existing only as thoughts. Essentially, this form of objectivity relates to the world in terms of the self – how an object can serve the individual's interest. The human existence is an oscillation between these two modes of being, between monologue and dialogue, between conceptualization and interaction.

4. The most influential concept of "dialogue" is developed by David Bohm. The quantum physicist observed that the functioning of brain follows the model of the hologram, in accordance with the quantum mathematical principles and the wave pattern[2]. As well, the representations in the brain (images), including traditions, beliefs and habits shape the real world as patterns of thought. Later, and in accordance with these observations, Bohm states that thought is a largely collective phenomenon, which is possible through communication and culture. Bohm propose a systematic nature of thought: *"What I mean by 'thought' is the whole thing - thought, 'felt', the body, the whole society sharing thoughts – it's all one process. It is essential for me not to break that up, because it's all one process; somebody else's thoughts becomes my thoughts, and vice versa. Therefore it would be wrong and misleading to break it up into my thoughts, your thoughts, my feelings, these feelings, those feelings... I would say that thought makes what is often called in modern language a system"* (Bohm, 1992, p. 18).

It result that the images of the observations we make on real world and the assumptions of our judgments have a *transpersonal* dimension, and all these patterns form an "ocean of meanings" which is influenced by human *conversation*. This process is called by the author *dialogue*.

In the author's view, *conversation* denotes a Platonian dialogue, where each interlocutor defends his position; a more adequate name is *discussion*. By contrast, the *dialogue* suppose sharing thinking and feelings in an '*ocean of meaning'*, which continually flows and evolves, as well as peoples involved in dialogue reach new, deeper levels of understanding which none could have foreseen. Through dialogue *"a new kind of mind begins to come into being, based on the development of common meaning... People are no longer primarily in opposition, nor can they be said to be interacting, rather they are participating in this pool of common meaning, which is capable of constant development and change"* (Bohm, 1992, p. 20).

Bohmian dialogue is at core at his **epistemological** system. Essentially, dialoguing mean an *exploration* among collective beliefs. Participants examine the assumptions underlying their individual understanding and common knowledge to reveal

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[2] The scientific and philosophical works of David Bohm cannot be actually separated. The holonomic model of brain function, developed by the neurobiologist Karl Pribram in collaboration with David Bohm, theorizes that memory/information is stored not in cells, but rather in wave interference patterns. Bohm's research on cognition and thought started earlier, and a great influence on his work had the philosophy of Krishnamurti (1959): "I was impressed by the way his own [Krishnamurti] philosophical meshed with my ideas on quantum mechanics" (Bohm, 1980).

blind spots and incoherencies. Bohm emphasize that this *collective learning* increases our collective intelligence an leads to greater connection, understanding and harmony.

5. It is interesting to observe that the evolution of the concepts on "dialogue" added new meanings, but never create a substitute for one or all the previous. In fact, the nature of dialogue result from the context, and a certain meanings is adequate to the contents' specificity: dialogue is a *narrative support* in a drama, *a way to find the truth* for teaching purposes, *a mode of conscience and interaction* in participative environments and *an exploration tool* in negotiation, and the list may continue.

Also, the dialogue can take different forms in the same context and evolve from one nature to other. The *narrative support* can dissimulate a *mode of conscience* as well as an *exploration tool*; or, in participative environments the dialogue is often argumentative, especially when the purpose of the meeting is to reach an agreement. It is almost impossible to find a single aspect in a dialogue process, and this is why we may say that dialogue is "gregarious" in nature.

Dialogue and communication

Whatever definitions we accept for "dialogue" and its nature, it is obvious that the process consist in *communicate* or *exchanging messages*. Is the dialogue a form of communication? Paradoxically, the answer for this question is not so obvious.

Indeed, dialogue is not and cannot be a subject for the theory of communication[3], if we consider it literally (fig. bellow).
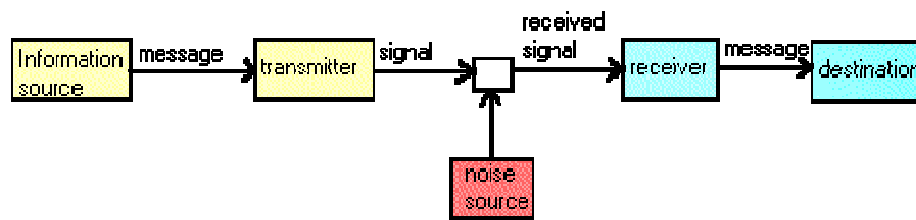
Communication considers the message as a *chain of signals* sent through a channel, and focuses on the technical conditions of the connection or the fidelity of the transmission: how adequate is the signal (encoded) according the environment (channel), how accurate is the reception of the message (decoded), the status of the source of signals and the message's receiver, the feed back connection, the structure of the communication

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[3] We consider the classical approach in the communication theory, as Hartley, Shannon and Weaver stated it for the first time (see Shannon, 1948). Later, this theory became the *information theory*, but no arguments for this transformation as long as it is almost unmodified. Recent developments, using same model, inferred new elements in the communication process, notably semiotic rules: syntactic, pragmatic and semantic. As well, the theory of communication became *communication science*, with many branches: non-verbal communication, symbolic communication, animal communication, mass communication, interpersonal communication, organizational communication etc. In fact, we can consider this evolution as a restriction applied on the original model and resuming communication at a single code: the language.

etc. This theory does not operate with the *content of message*, because any set of successive signals faces same technical problems in a communication connection[4].

The content of the message is a subject for *semiotics*, which associates certain signification for certain message. In this case, the message is a fixed set of signals, reproduced identically in all cases when it is used, as well as this structure conserve a defined meaning, accepted both by the sender and the receiver of the message. Semiotics does not suppose any fixed technical structure to send messages, in the sense of the communication theory, it presume that a connection exist and has no technical problems.

The dialogue process supposes both a communication pattern and a fixed meaning for the message, and it can be theorized as a form of communication *and* a semiotic structure. More adequate is to consider dialogue to be an interdisciplinary field, situated between communication and semiotics. This theory, says Foerster[5] *"consists of many parts, including an architectural model of languaging, a detailed semantic logic, a formulaic representation of agreement, and vast data on the nature of individualized learning in many modes."*

1. As a special form of communication, we must note that dialogue refers strictly to human interactions, whatever we name it: conversation, debate, negotiation etc. Technically, to transmit messages through dialogue do not suppose any special infrastructure, except the conditions to put together the participants – meeting, phone, letters etc., and to use same code – language.

The communications structures appear related to the *number* of participants, and the simplest is when two peoples talk together. Blake (1996) considers this structure to be a "dyalogue" (not "dialogue"), and support three kind of interaction, according to the logic of inclusiveness, exclusiveness and sameness: YES-AND, NO-BUT, and, in sameness, *"when one person stops talking, the other continues as if with the same voice"* (p. 19).

More sophisticated structures emerge when more than two persons are involved in dialogue; the author names it "trialogue", "tetralogue"… N-logue, according the number of participants. In the tetralogue structure, for example, the participants are connected as in the figure bellow:
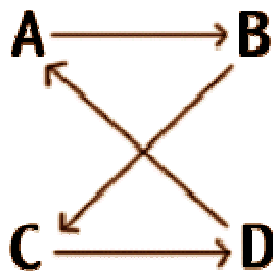
The communication inside this structure, says the author, is a combination of "dyalogues", *"what is said by any one of the people is affected not only by the person who spoke before but by all the others as well. The net result is akin to a 'rotation'*

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[4] Weaver stated and emphasized this as a basic assumption of the communication theory. Later, other authors criticized it, arguing that this hypothesis transform the theory in a purely technical one, without consideration for human communication.
[5] See Pagano, 1993

around an idea or theme, which is seen from different perspectives - as a piece of sculpture viewed from various sides" (p. 21).

From the communication theory point of view, the result of the interactions in the dialogue process is a *network*, where the connections can emerge spontaneously or can be deliberately designed. Inside a network, two communication patterns are possible: *two-ways communication* (each participant is connected with only one other and can react immediately, like in telecommunication network) or *one-way communication* (when all participants are connected simultaneously at one speaker and cannot react immediately, like broadcasting communications).

Blake considers the second pattern to be adequate for *'monalogue'* (not *'monologue'*, which means *'meditation'*), and not for all other structures, as long as participants are *active* parts in the communication process. This distinction is quite fragile.

We will consider the *action* in dialogue when an actor adopts one of the three positions: *inclusiveness, exclusiveness* and *sameness*. The position may be *implicit* or *explicit*, according to the rules of the present dialogue process. Following the distinction drawn by Blake, only if the position is revealed immediately, so if the position is *explicit* in the present dialogue process, the communication pattern is *'dyalogue'* or *'N-logue'*, otherwise is *'monalogue'*. But the moment of the effective reaction is important if we attempt to establish the *efficiency* of the dialogue process, not for the patterns' definition: a forthcoming dialogue process will make, possibly, the *implicit* position an *explicit* one. In this assumption, the implicit and explicit positions worth equally for the dialogue structure, *'monalogue'* support same kind of interaction as *'dyalogue'* and, in fact, *'monalogue'* is a *'dyalogue'* where the participants' positions are hidden in actual communication process.

This argument proves that the communication pattern of the dialogue process is a *two-way* type; this is similar to state that dialogue presumes an *interactive* communication, which is true by excellence.

2. In later versions of Shannon's model of communication appears a feedback connection[6] between the receiver and source which generated a lot of interpretations. One, it may be considered to be the result of the noise, which distorts the signal sent by the source: to find out if and how the noise affects the communication it is necessary to compare the production of the source (original message) with the result (the received message). This interpretation is consistent with the technical approach of the communication model.

Assuming that a message sent through the channel is somehow significant for the receiver, the interpretation of the feedback connection is different: this is the reaction of the receiver, consistent with the content of the message, not an effect of the presence of noise. This approach is more adequate for human communication and we may consider it as a basic model of the dialogue, or, at least, the technical model of the interactive communication.

Both interpretations presume that source and receiver can switch from one position to the other, as well as the receiver became source in a second sequence of

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[6] In the paper published in 1948 the feedback connection is not figured, it appears later due to an evolution of *communication theory* toward *information theory*. The feedback connection is mentioned also by Shannon in the article wrote for Encyclopedia Britannica in 1956.

communication (the feedback connection); as a result, the source production is modified according the reaction of the receiver. Consequently, the source and the receiver are active participants in the communication process.

In human communication, the most usual code is the language, where the signs (or signals) may be letters, sounds or gestures. The language is a set of conventions, largely assumed, which consist in a set of rules governing the lexical (vocabulary) and syntactic (grammar) conditions for an intelligible message. The basic, the *signifier-signified* relation[7], links a word (or another image of an object) with the conceptualization of the object. It is important to mention that the signifier (or the word, etc.) is a convention, culturally dependent, while the signified has a real correspondent which may be common for many cultures.

Interactive communication requires more than a code (the language's rules governing a message) to be effective: the message has to be *significant* for the user, or, in other word, message should have a particular *meaning*. The *meaning* reveals a relation between the sender and receiver's knowledge and the content of the message; it is a personal *valeur* (Saussure) of the word, due to the experience, culture and education. Only under this condition sending or receiving a message became an active process, and this process is socially and culturally conditioned.

In fact, the message itself has no meaning. Berlo (1960) states a number of thought-provoking observations on the nature of meaning; three of these are highly interesting:

- *Meanings are not in the message; they are in the message-users*
- *Meanings are never fixed; as experience changes, so meanings change*
- *No two people can have exactly the same meaning for anything*

According Berlo[8], sender *encode* and receiver *decode* the message through a filter including *common skills* (i.e., speaking, writing, and hearing, listening, respectively), and *particular skills* (thought and reasoning); these last are related to the knowledge, social system, culture and attitudes.

Certainly, there should be a *common value*, or a *basic meaning* of a word, which both sender and receiver share in the communication process. Rather, the meanings are only similar and not identical. This minimal condition of the message is the *denotative* or *referential* dimension of the meaning, which reflects the *sign* → *object* relationship. Also, there is a personal dimension, or *connotation*, the meaning which individuals associate with a sign[9].

Barthes (1987) considers more than one level of meaning. The first is denotation, the connotation to be a second-order of signification. In this framework connotation is a

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[7] There are two words to denote same science: *semiology*, according to Swiss linguist Ferdinand de Saussure (in Cours de linguistique generale, published in 1915 after his death), and *semiotics*, by the American philosopher Charles Sanders Pierce. There are not essential differences between semiology and semiotics, except the basic relation: for Saussure this is a dyadic relation, as mentioned, and for Pierce is a triadic relation – sign, object and interpreter. Despite this, the two words define same science, because the basic relation is only an analytical tool, and do not affect the assumptions, principles or results. For the dialogue's topic, the Saussure representation, which evolved from linguistic studies, is more adequate.

[8] See the SMRC model, in Berlo (1960).

[9] Modern semiotics considers two more dimensions of the meaning: *structural* – the meanings given by the formal grammatical structure of the code, and *contextual* – the meanings we get from the context surrounding the sign. These may be interpreted both as common and personal dimensions.

sign which derives from the signifier of a denotative sign (so denotation leads to a chain of connotations). This is the mechanism by which signs may seem to signify one thing but are loaded with multiple meanings.

The semiotic approach sees communication as a *mutual negotiation* of meaning rather than a linear transfer of messages from transmitter to receiver. We must observe that the minimal requirement of the meaning (denotative or referential) is sufficient to communicate interactively. In the Blake's pattern of dialogue (1996), this is the position of *sameness*, as long as all dialoguers share an identical meaning of the message.

This situation is both rare and unsuitable, except, perhaps, the dialogue which is a narrative support in nature. But, assuming that dialogue has other purposes, argumentative, interaction or explorative, a *semantic differential* (Osgood, 1957) should be presumed. This means that the personal dimension or *connotative* aspect is essential to start and sustain a dialogue where *inclusiveness* and *exclusiveness* meaning creates a basis of the dialoguer's attitude and position.

The efficient dialogue

When a dialogue is an ongoing process, it creates stable communication structures, or dialogical groups. It is natural to consider the emergence of one group having a certain *a priori* purpose, even it appears accidentally. The word 'purpose' might refers to debate a subject, to reach an agreement or to explore the significations of one term. It is also natural to examine how adequate is the structure, and it might be expressed in two ways: how large should be the group, and how many time is necessary to reach the purposed objective.

1. The size

The number of the group's members is important for two reasons. First, it requires a minimum number of people connected one to others, as well as the group can work as a stabile structure. This is the critical size above which groups cease to be able to function effectively. Friedman[10] (1974) emphasizes that an individual, or a collective body for that matter, can only maintain a very limited number (*'valency'*) of effective contacts thus forcing the communication pattern into a stable form. Usually, this number is 3 to 5 for groups in a state of tensed dynamic equilibrium, where non-hierarchical pattern is essential to its integrity[11].

Secondly, we must observe that the structure is efficient if provide a maximum of benefits for all the actors. Larger groups are not necessary more efficient as knowledge exchange structures. Helsley and Strange (2004, p. 4) shows that *"membership in larger group does not always enhance knowledge transfer. This is because when the number of agents is large, it is easier for an agent who withholds knowledge to go unpunished.*

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[10] See also: Representation, Comprehension and Communication of Sets; the role of number, (1979); Judge (2004); Blake (1996).

[11] Groups engaged in a dialogue according Bohm theory are larger, 10 to 40 peoples, who sit in a single circle, for a few hours during regular meetings or for a few days in a workshop environment. Participants "suspend" their thoughts, motives, impulses and judgements – exploring and attempting to "think together" collectively.

Thus, the sustainable level of knowledge barter is smaller in large groups. This result suggests that the formation of exclusive groups may not be motivated only by sorting but also by the need to create groups small enough so that cooperation is possible".

2. The duration

An efficient dialogical structure is the one which reach the objective as soon as possible, examining all the significances of the subject. The duration of the dialogue depends dramatically on the qualification of the group members: if the members of the groups are randomly selected, an efficient dialogue is a very difficult if not an impossible task: not all 3, 5 or other number of members in a group can establish such a structure, and it is enough to observe the condition of the common language. When the expertise of group members is adequate to the dialogue objective, the duration varies on the group size: smaller groups need a short period to debate or reach an agreement, for instance, but with loss in meanings. On the other hand, larger groups require more time to achieve the goal, but they might provide a more accurate solution.

The efficient dialogue is a balance between the group size and the duration of the dialogue process. It is adequately is to consider the *activity level* inside the group to be relevant for this dimension. Thus, the optimum criterion is related to the *ability* to communicate inside a structure and the duration to be done by the *possibility* to communicate.

Let consider a number of *n* actors involved in a dialogue group. The members of the group may take three positions in the dialogue process, according Blake (1996): YES-AND, NO-BUT, and sameness. They are *actively connected* if they engage dialogues and share meanings with other members of the group, namely if they express *explicitly* one of the position YES-AND or NO-BUT. Otherwise, they do not express the position or if they are in a sameness situation, they are passive participants in the others' debate.

Members can dialogue with the others and debate or negotiate meanings under the previous assumptions only in a *two-way* communication structure. It means that the dialogue is active in a one-to-one conversation, or *interactive* communication, when actors switch between two positions – sending and receiving a message. Thus, the dialogue process in a group consist in create one-to-one connections between members; these connections change during the dialogue process, as well as all members can connect each one other.

In a group with *n* members the total number of the possible connections is:

$$2C_n^2 = 2\frac{n(n-1)}{2} = n(n-1)$$

Certainly, this number reflects all combinations of two actors involved in communication processes, and not the simultaneously effective connections; this last one, obviously, equals half of total number of users.

Let *2k* to be the number of the group members connected at the time to the dialogue; we will name the ratio:

$$i_o = \frac{C_{n-2k}^2}{C_n^2} = \frac{(n-2k)(n-2k-1)}{n(n-1)}$$

the *group availability index*. The value of the index vary from *0* to *1*, respectively for *k=n/2*, (when all simultaneously possible connections are effective) and *k=0* (when no connection is realized). The lowest non-zero value will be called *marginal availability* (*i_{om}*), and it is equal to *2/n (n-1)* for *k=(n-2)/2*. Reciprocally, the highest value different from 1 will be the *maximal availability* (*i_{oM}*), equals to *(n-2)(n-3)/n(n-1)* for *k=1*. The minimum number of users satisfying simultaneously these two conditions (when *i_{om}= i_{oM}*) is *n=4*; this group size is important for the reason that is the lowest level where group dialogue can produce some effect. Note that the number is consistent with the result obtained by Friedman (1974).

The availability index is a technical measure of the *inactivity* inside the dialogue group. Correspondingly, we may also express the *activity* level as *group-loading index*:

$$i_l = 1 - i_o = 1 - \frac{C_{n-2k}^2}{C_n^2} = \frac{C_{2k}^2}{C_n^2} = \frac{2k(2k-1)}{n(n-1)}$$

We must note that only an inactive member may realize an active connection with another inactive member depending on the availability index; he/she may be the sender of the message (and initiate the active connection), or the receiver. Because these positions in this new connection are indistinctive at a time, when *2k* users are connected the probability to determine who is the sender or the receiver in a new contact is *(n-k)/n*. For this value, we have the *theoretical availability index* (*i_t*):

$$i_t = \frac{C_{n-k}^2}{C_n^2} = \frac{(n-k)(n-k-1)}{n(n-1)}$$

When *i_o=i_t*, we have an optimum condition for the group activity, which signify the *maximum probability to realize a new connection at a highest group loading level*. The solution in *k* of the equation expresses the value where the system is in equilibrium; there is only one positive solution, *k=n/3* and we obtain the expression of the *equilibrium index (i_e)*, which must reflect the optimum condition:

$$i_e = \frac{2n(2n-3)}{9n(n-1)} \approx \frac{1}{2}$$

The value of this index is strictly lower than *1/2*, as well as the probability for a member to realize a new connection is strictly higher than ½, which verify the optimality condition.

The system might be far from equilibrium and optimality in two situations:

- when *k>n/3*, the equilibrium index is higher than ½, then the probability to realize a new connection decrease; the system is suboptimal due to the loss of meaning, as long as the actor cannot exchange messages;

- when the *k<n/3*, the equilibrium index is lower than ½, then the probability to realize a new connection increase; the suboptimality refers to the low level of the dialogue process inside the network, and might be done to an inappropriate structure of participants.

We may also verify these conclusions. We assume that the dialogue process is finite, in a *T* period of time. During the process the group members change messages and

meanings, but members contribute differently to the dialogue; thus, each one has a particular opinion (or meaning) to share with the others by dialogue, and *T* depends on

$$\sum_{\frac{n}{2}}^{n} \Delta t = \frac{n(n+1)}{2} \frac{2}{n} \Delta t = (n+1)\Delta t = n\Delta t + 1\Delta t = T + 1$$

the total number of these opinions. We suppose too that all members share a common meaning – a denotative meaning – and all of them have at least one particular connotative meaning to communicate. For computational reason we will consider the *number of meanings* to be the contribution of each member of the group; the total number of meanings involved in the group dialogue has a normal distribution among group member.

Let be *Δt* a time period to communicate one meaning, equal for each actor; we define the *marginal duration of the dialogue* (*T*) the number *n* of *Δt* period required to satisfy the entire demand for dialogue, as well as any group member may be active and communicate one meaning at least one time and at most *n* times. The total number of active connections during this time equals the sum *1+2+...+n* and *T* is proportional to the maximum number of simultaneous connections:

This result shows that in the most severe condition of the dialogue process (when all members of the group are connected simultaneously) one meaning of the total number of meanings shared among the group members remain unexpressed. We may only suppose that this one is the denotative meaning and, in this condition, we may observe that denotative meaning is not significant in the dialogue process.

When the total number of active contacts decrease, the loss in meaning increase logarithmically; for instance, if one possible contact remain inactive the loss in meanings is higher than 1:

$$\sum_{\frac{n}{2}-1}^{n} \Delta t = \frac{n(n+1)}{2} \frac{2}{n-2} \Delta t = n\Delta t + \frac{3n+1}{n-2} \Delta t \cong T + 3$$

The conclusion is that a group dialogue should be planned in a manner to ensure the possibility for each member to be active at least one time, even if it means to double the total duration of the process; at the optimum level *(k=n/3)* this is *T+[(n+3)/2]Δt,* for no loss in meanings condition.

Foresight-oriented dialogue

In a recent paper, Staton (1996) says: *"A strange thing about foresight is that you rarely hear anything about the future."* In the author's view this is a not surprisingly idea, because the future, as defined usually, is not, and cannot be, the major topic for the foresight activities. The argument is that the future, as an extension of the present, is not adequate for foresight purposes: the future is shaped by conflicting and competing discourses and ideologies, while the foresight claims for a stable environment, where debate and consensus may be possible. Nor methodological tools are adequate: *"Current approaches to foresight emphasize discussion, consensus building, network building,*

inclusiveness, interactivity, process benefits, dialogue - we are all familiar and comfortable with these approaches and methods. [...] In brief, I would suggest that it is very difficult, perhaps impossible, that the future, the future in a strong sense – the future proper, a future other than an extrapolation of the present – can ever emerge out of this dialogic process".

This position illustrates a common confusion generated by a weak distinction between one action which support a particular activity and the activity itself, and it is not only the case of foresight. The foresight does not consist in a dialogue related to one specific topic, whatever complex and extended might be. The dialogue, in this case, may be seen as a *support action* for the foresight activity, or as a *resource* which may offer solutions for sustaining it. This is a 'dialogue in' for the foresight, and the discussions may focus on various related themes: sustainability, science-society dialogue, environmental policy etc. The purpose of this dialogue is to reveal new meanings for 'foresight', as a second-order significant (Barthes, 1987). Certainly, words like *future, vision, forecast* etc. may not be mentioned, but any loss in meaning: in fact, there is a third-order of signification for these words.

Dialogue might be also considered as an activity itself, even in relation with foresight. This is a 'dialogue about' the subject, which is concerned on a denotative meaning of the word: the dialogue will emphasize the connotations of the related words like *future, vision, forecast* etc. and the purpose is to negotiate a common meaning for the subject-word, *foresight*.

1. A foresight 'dialogue about'

As in many cases, it is not one definition for the word "foresight"; the term is often used in connotations with "futurology", "futures studies" "prospective studies" and so on. Some kind of mutual agreement seems to be realized on what foresight is not: prediction or forecast.

In fact it is difficult if not impossible to find a definition for 'foresight', in the terms of Aristotelian logic – genus proximus and specific difference. The meaning of the word 'foresight' is more general than 'prediction', 'policy-making' or other related words; as well the genus proximus is 'foresight' itself and no specific difference will be emphasized. Thus, any definition will cover a 'semantic space' related to the requirements of one particular model and the sum of all possible definitions became a 'microcosm of the large culture' (Bohm, 1991) instead of a largely agree meaning.

A foresight 'dialogue about' purpose is not to find a common language to extract a meaning of the word from all particular definitions; it might be a never ending challenge. The aim is to find all the elements, at the denotative level of meaning, which may appear in the definitions.

First of all we must observe that the word 'foresight' defines a human activity founded on knowledge, essentially a scientific research both fundamental and applicative, covering a large area of themes. Whatever heterogeneous this area could be, foresight should provide common attributes, valid for any particular theme.

One "official" definition[12] states:

"*Foresight covers activities aiming at:*

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[12] http://cordis.europa.eu/foresight/definition.htm

- **Thinking the future:** *Forecasting, technology assessment, future studies and other forms of foresight try to identify long term trends and thus to guide decision-making.*
- **Debating the future:** *Foresight is a participative process involving different stakeholders.*
- **Shaping the future:** *Foresight aims at identifying possible futures, imagining desirable futures, and defining strategies*". (CORDIS).

Regarding the nature of the foresight activities, there are two elements to be emphasized[13]:

- *the anticipative approach,* where the knowledge is in position to explore trends of the future and to define reasonable objectives
- *the strategic approach,* which define the road to follow to achieve the proposed objectives

Foresight is defined, as well, by these two aspects which are inseparable. An activity consisting, for instance, in "policy-making processes, in which collective learning is developed in the S&T (Science and Technology)-related area via interaction between industrial, academic, governmental and social actors" (Rémi Baré, cited by Rask, 2007) might be anything else than *foresight*.

A 'dialogue about' in foresight is related to the connotations of "anticipation" and "strategy", where particular values refer to the scope of foresight applications. Thus, more domains are included in foresight programs and more peoples (stakeholders) involved, more meanings for "foresight".

Such a dialogue provides the essential characteristics of the Bohmian dialogue:

a.   The dialogue *emerges spontaneously*, due to the fact that foresight domains are strongly interrelated: anticipative studies do not ignore the reciprocal implications in identifying possible future evolutions in other domains, and the policy-making frame includes multidisciplinary patterns. Under these constraints stakeholders must be involved in more than one foresight program, as well as the dialogue became an extended participative process.

b.   The dialogue is purely *exploratory*, its meanings and its methods continue to unfold. The dialogue can begin by any topic of interest to the participants. No rules are enforced to conduct dialogue, no ex ante purpose is provided, no predefined results are expected. Dialogue is determined only by the willingness to explore and the only foreseeable result is creating a pool of common meanings.

c.   The dialogue creates an *"open space"* where people can interact with no restrictions. All issues important for one participant are raised and submitted to all participants to debate. The most important attribute of the dialogue in an open space is the multidisciplinary of approaches.

The globalization and communication technology contributed to a wide spread of knowledge, a simpler messaging, and dialoguers' virtual encounters. "Open space" switch from virtual to real, since everybody may access any information and contribute to the global knowledge. It droved finally to a 'depersonalization' of dialogue, as well as

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[13] In the definition above is also mentioned the extension of the foresight, both on research field and on person involved; this aspect is not related to the nature of this activity, but to the methodological tools.

communication between abstract entities is not anymore a metaphor. Foresight itself is, in this view, a dialogue, namely a 'science-society' dialogue. *"When experts, stakeholders and decision-makers are involved in the foresight process, the knowledge, assumptions, values, wishes and visions of these people are activated and included and mutual-learning processes initiated. Such processes are therefore in effect science-society dialogues"* (ERA Net, 2006).

2. A foresight 'dialogue in'

'Dialogue in' examine the dialogue process as a methodological tool for sustaining foresight activities, focusing on particular topics. The purpose is to develop adequate forms of dialogue, as well as the available resources of the research fields are better assigned to achieve their own goals.

In a more general model, Judge (1992) considers a systematic model for the relation between the *resources* involved in human activities and the *typology of the dialogue* required by the actions' efficiency. The author considers four types of resources (*spiritual, knowledge, human* and *material*) and four groups of varieties of dialogue ('arenas'), correspondingly: *Adaptive dialogue, Innovative dialogue, Transformative dialogue,* and *Becoming dialogue*. Foresight, apparently, may be framed as a *transformative dialogue*, but it is also a strongly related with *innovative* and *adaptive* dialogue too.

In fact, it is difficult, if not impossible, to rely one particular activity's dialogue style of a particular variety of dialogue[14]. Most of the cases there is no about a single form of dialogue; a more adequately formula is a *mix of appropriate dialogues*, according specific tasks involved in the activity. In foresight, *anticipative* and *strategic* approaches require different varieties of dialogue, and specialized topics (like participation, learning etc.) in specialized fields (information technologies, sustainable development, health, nanotechnologies etc.) must adopt more particular solutions for the dialogue process.

1. *Prospective studies,* as the main formula of the anticipative approach, require a large participation and various perspectives to see all implications of one single vision. They are essentially *explorative* and *interdisciplinary*, (as in the Bohmian dialogue), but do not emerge spontaneously. Moreover, an ex ante purpose is an expected result should be presumed. Also, the 'open space' is limited to a number of specialized topics, as well as stakeholders are, generally, experts in particular domains.

The dialogue's main purpose in prospective studies is to 'find the truth', thus it is *argumentative* and *learning* oriented. In nature, such a dialogue is Platonian, where personal knowledge, feelings and visions must lead to an impersonal and realistic result, which is not negotiated.

The nature of foresight 'dialogue in' appears to be dual, both Bohmian and Platonician. In fact, the dialogue process has two levels:

    a. *Inside core groups*, where the dialogue is organized around the proposed topic and the rules to conduct dialogue are adequate to find a common point of view. Such groups require a high level of expertise, not

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[14] Author itself mentions: *"Certain issues prove unresolvable leading to a dialogue crisis. Reliance on the approaches to dialogue in a particular arena is then recognized as inadequate to the challenge. The arenas may then be understood as 'feeding into' each other"* (Judge, 1992; see also Blake, 1996).

necessarily interdisciplinary. The dialogue prove a dominant Platonian dimension, and this is the rule; also, dialogues may be organized randomly – some kind of operational research techniques – which is the exception.

    b. *Between core groups*, emphasizing the interdisciplinary aspects. This dialogue might be Bohmian, in the sense that it may appear spontaneously, aims and purposes may be ignored, and rules to lead dialogue are not necessary; this is the case when dialogue is not systematically organized. Relations between groups might be established on a thematic and timetable base, but does not reject any casual contact.

2. *Policy-making studies* require consensus to enforce the results. It is here an *intercultural* dialogue, where collective perceptions, feelings and visions play a very important role. In policy-making dialogue *stakeholders* involved are, in fact, groups or representatives of homogenous collectivities, not necessarily experts in the field of interest for the foresight dialogue. The purpose of the dialogue is to reach an agreement, which may be not the most adequate to the objective revealed by the prospective studies, but the largely accepted.

The foresight 'dialogue in' on policies is possible if some preliminary conventions are enforced. This condition is essential due to the strong social component of these approaches. As well, dialoguers should consider the collective identities to be equally respected for all stakeholders. They must also accept that efforts to enforce the negotiated result are equitable distributed, preserving the interest of each group.

The policy-making dialogue reveals an existential dimension of the dialogue, as philosophy and attitude to engage with others. The dialogue is possible because peoples are relational beings and it takes place in "*the space between*" (Bubber, 1947); the policy-making dialogue has the role to maintain it fair and trustful. Without a trustful engagement with the other, a turning towards dialogue is impossible.

Conclusions

Each activity develops particular variety of "mix of dialogues" processes depending on activity's nature and complexity. There are a strong relation between the dialogue and corresponding activity, but the mentioned activity does not consist in dialogue. The dialogue might be expressed as an 'alter ego' of the activity or as a reflection in knowledge and communication of the actions sustaining the activity.

Foresight is homogeneous activities as it combines anticipative approach and prospective approach in a unique body of knowledge results. The correspondingly "mix of dialogue" should provide same attribute of homogeneity, in respect of efficiency criteria.

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