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The Problem of Naturalizing Communication.

Meaning and Information in the World of Causal Chains

1.   Elements of the definition of communication

Communication may be understood in many ways. One may distinguish different aspects in the communication process finding that communication is (the following are the elements of definitions given by F.E.X. Dance): an exchange of thoughts, transmission of information, ideas, skills, etc. It is a process that links different elements of the world[1]. It is also possible to list many other characteristics essential for understanding communication. In the definition provided by T. Zarębski[2] two aspects of communication are highlighted: firstly - communication (following intuition) consists in conveying information from the speaker to the receiver; secondly – communication consists in conveying the meaning. In this definition there are two significant defining notions: information and meaning. Giving a way of understanding of these two notions will make it possible to understand the quoted definition.

2.   Elements of communication process in naturalism

I would like to discuss communication, meaning and information from the perspective of cognitive science. I assume that analysis of what communication is should meet ontological, conceptual and methodological (theoretical) coherence (commensurability). Such commensurability may be guaranteed by adoption of two assumptions common in cognitive sciences: assumption about naturalism and assumption about individualism. If communication is to be understood in a naturalistic way then all elements of communication should also be considered in a naturalistic way (meaning, information, transmission, shared attention, common thoughts, combining the elements of the world). The condition necessary to adopt a naturalistic approach towards the communication process is assumption about individualism, stating that communication takes place between individuals and not in a group, society, class or family.

        In the cognitive research it is common to accept two above-mentioned assumptions in both, ontological and methodological version.

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[1]Cf. F.E.X. Dance, The Concept of Communication, „Journal of Communication", 1970, vol. 20, 201-210.

[2] T. Zarębski, Komunikacja z perspektywy inferencjalizmu…., s. 159.

According to the ontological individualism (in its model, extreme version) people are the ultimate subjects of psychic, social and cultural reality. If so, then this assumption allows to resolve (somewhat by assumption) some of the problems that are present in this approach, for example: does communication realize on the level of collective, supra-individual (social) structures (systems), or does communication occur (exists) solely between individuals?

Within the methodological individualism the final description, methodologically correct, and the explanation of social reality should consist of statements including terms about individuals or ones that can be reduced to such. Then the questions arise: can one investigate, describe and explain communication referring to individuals, their properties and to individual states. Or does it require referring to descriptions and explanations in terms referring to the level of social structures (supra-individual systems) .

Theories of language, meaning, subject, culture based on anti-individualistic (holistic) assumptions are dominant in commonly considered concepts of communication. Therefore it is worth studying such holistic representation of language and the user of language who is the subject of communicating and through it also the subject of cultural acts.

The holistic concept of language was given by F. de Saussure. In his concept the language is a holistic system, it is a formal being and not a physical or psychic one. In such a concept the language as a system does not undergo individual-driven language changes – a language cannot be changed by an individual. [There is no the Humpty Dumpty phenomenon as in *Through the Looking Glass* where Humpty Dumpty convinces Alice that he is "the master of language" and makes words mean what he wants]. Another example of a collective (social) understanding of language is L. Wittgenstein's concept of a language in which for the language to function it is essential to follow the rules. These rules are of at least dual supra-individual character: to learn them is an effect of a training of the language user as a member of a given society living in a certain socially determined way; and secondly observing rules assumes control and sanctions and this in turn requires referring to other members of society, language rules assume the existence of others who control deviations from rules. On this premise Wittgenstein argued that the private language cannot exist.

In short, we may say that anti-individualism/holism assumes *inter alia* that language – if understood as a social institution – is a social creation, supra-individual. It is also evident that using the language likewise referring to social meanings requires that one perceives the communication system in a way that cannot be reduced to individuals and their properties. Other consequence is that the language is not a mental being and a meaning does not depend on psychological states of the subject.

Linguistic holism is related to socio-cultural holism. Since language is an essential element of cultural reality it is worth mentioning collective (holistic) assumptions related to cultural and social conditions in which communication process takes place. In such an approach a shared knowledge, common knowledge about the background and cultural knowledge that is a condition to understand a

message, read intentions does not come down to (is not reduced to) knowledge, beliefs, a system of individual representations, but is a system of social knowledge, social representation, social memory (e.g. myths, value systems, interpretation of codes, understanding kinship, sense of behaviours, rituals).

In short, in such an approach referring to elements of cultural reality cannot be reduced to the system of individual mental representations, individual psychic states, and particular behaviours and their effects such as e.g. signs. Eventually cultural reality cannot be taken down to the reality of psychic states.

Against this background some examples of a thesis related to individual approach to language (and culture) may be presented. In Noam Chomsky's conception language is understood in a very individual way (it is a mental organ of an individual subject). It is also assumed that only I-languages exist (internal, individual), only idiolects exists whereas public language, i.e. E-language (external, public) is an 'artefact' of linguistic research. Language serves to express thoughts of an individual subject, and its communicative function – transmission of subject content is something haphazard. Linguistic competence is a type of subjective knowledge available introspectively only, and the description of this knowledge is a task for linguistic studies. It is a description of a grammar of a given language (that is the language that is created when the rules specific for a given language are 'added' on top of common universal grammar and innate linguistic competence).

Individualistic approach to culture, to the elements of social and cultural reality are presented in D. Sperber's book *Explaning Cultur. Naturalistic Approach.* He interprets the cultural reality in individual categories of representation and processes of their replication (the epidemic theory applied to cultural phenomena comes useful here). In this approach all cultural phenomena are effects of replication of individual systems of representation based on subjective cognitive processes. Mental representations are of the neuronal states nature, and public representations (signs, sculptures, pictures, movement sequences) are objects of physical nature. The meaning of all public representations is meaning assigned by individuals only.

3. Problems of naturalism and naturalization

As in the case of individualism vs. holism oppositions there are usually two forms of naturalism distinguished: methodological and ontological /metaphysical one.

The latter is often accepted in many methodologies: from natural sciences, through social to cultural sciences. It assumes that research procedures of these sciences constitute (should constitute) a specific version of procedures applied in natural sciences (physical), and its main assumption is that it does not consider statements that refer to supra-natural beings i.e to beings other than those determined by natural sciences.

In discussions the reductionist version of naturalism is often adopted (approximate or identical to the physical standing). Therefore it is assumed that terms/notions/sentences enable reduction (bring down to, define) theses of theory other than natural to forms without terms/notions/sentences referring to supra-natural beings. In this version the dispute over naturalism becomes a dispute over reductionism. However, a non-reductionist version of naturalism is possible and then non-reductional (methodological) naturalism allows autonomy of research methods of particular empirical domains (methodological pluralism) which assumes specificity of methods in particular domains.

Naturalism in ontological /metaphysical version relates to what exists, manners of being and criteria of existence. It is based on a premise that there is reality consisting of objects approved by well-established natural science theories. An argument in favour of this assumption is a success of natural sciences: there are objects discovered in scientific theories well-proven by research and technical achievements. Physicalism, which is a more extreme consistent form of naturalism, assumes that only physical reality exists, i.e. different forms of objects (mass) and energy. However, according to the opinion of the supporters of physicalism a strong version of reductionism is not necessary in the case of non-reductionist physicalism. According to this standing though, all objects do have some physical properties, however not all properties of objects are physical since some of them may be supervenient over the physical, base, properties.

A standing similar to physicalism is emergentism in a form that accepts ontological physicalism but also assumes that certain properties (e.g. mental) emerge from physical properties. Emergent properties are defined as follows: when the physical system reaches certain level of organisational complexity, new properties appear that cannot be foreseen and explained within physical theories related to secondary qualities.

Therefore, it may be assumed that within non-reductionist physicalism, although all individual objects or incidents are physical, some of them may be of non-reductional primary qualities. If we understand these qualities as emergent they do not reduce to physical qualities.
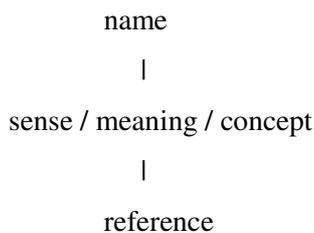
4.   An attempt to naturalize meaning

If communication is a transmission process, a transfer of meaning (as it is in the definition quoted above), the naturalistic approach placed by the act of communication in the world of natural phenomena, it should handle the problem of naturalization of meaning (and also information, knowledge about something). One of the concepts of meaning makes it equal to the truth conditions of a sentence. To determine truth conditions (when they do not entail deflation) requires reference to adequate reference theory, which should be compliant with – in the case of naturalistic approach – assumptions of naturalism (both, ontological and methodological).

Colloquially, we assume that the communication process is a transfer of meaning /references related to certain state of things or determined objects (a class of objects). Acceptance of an
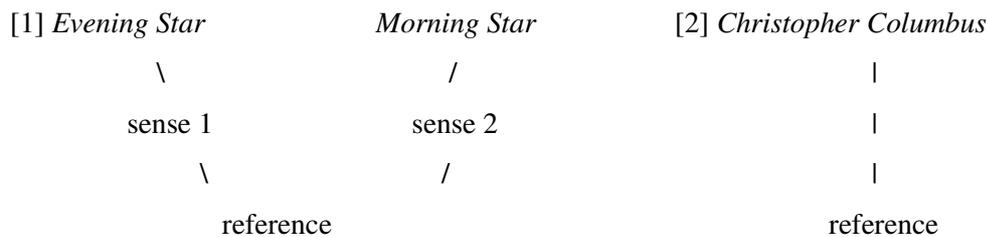
assumption about individualistic understanding of a communication act has to assume the existence of a reference method that would not only guarantee occasional transmission of semantic properties of the message of a sender to the message of a receiver but would also ensure their stability and objectivity. Such a reference manner is to guarantee the possibility to convey the same knowledge (about the same thing) despite changing subjects and their ways of representing the world. It is especially crucial for the stability and transmission of scientific knowledge.

5.   Foundations of the causal theory of reference (meaning)

The causal theory of reference[3], which meets the assumption of naturalism, is put in opposition to the descriptive theories of reference, the indirect reference theories (the casual theory of reference is also called *the direct reference theory*). The indirect reference theory assumes the existence of an intermediary element between the expression and its reference (designatum). For example, in Frege's theory of reference sense is such an intermediary element – it is a way of presenting a reference. These interrelations in both theories may be presented in the diagram below:

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            name
              |
    sense / meaning / concept
              |
          reference
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It is illustrated by the following example:

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[1] Evening Star        Morning Star      [2] Christopher Columbus
        \                   /                       |
      sense 1            sense 2                     |
          \               /                          |
            reference                            reference
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Ad [1] In the first example the designatum is an object of reference that meets the conditions of presentation /description – in this case it is an object that is a 'star' (i.e. shines in the sky) that appears in the evening. In the second example the conditions are: being a 'star' and appearing in the morning. In both cases these conditions constitute the sense of the name. The reference is an object that meets

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[3] Cf. two classical works including the main ideas of the causal theory of reference: S. Kripke, *Naming and Necessity;* H. Putnam, *The meaning of "Meaning".*

these conditions. In both examples it is the same (as discovered later) astronomical object (the planet Venus).

Ad [2] The direct reference theory assumes no intermediary in the relation:

> name
> |
> reference

In the causal theory of reference the relation between the name and its object of reference is understood as a causal relation. To understand this concept it is essential to assume that this theory is a combination of two theories of causal nature:

(a) grounded theory that concerns relation between a name and somehow indicated object, and

(b) the transmission theory of reference that concerns the manner of consolidating the reference by subsequent uses of a given expression and the way the causal chain joining the particular uses of a given expression is created.

For the communication theory the second constituent of the causal theory of reference is essential. It is vital for this mechanism of reference transmission that it includes the historical and social element. It results from the fact that each use of a given expression has its reference established in the very first act of its use and the subsequent acts of its use by the members of a given society transfer the reference of this expression (its semantic quality). According to causal theory of reference the reference (a proper name or a generic term) is an object (specific element, e.g. generic essence, singular essence) that was given a particular name in the moment of the grounding act ('baptism') and which is joined by a causal chain with the last use of a given expression.

Some of the problems of the causal theory of reference are worth mentioning since they are related to the problems of the naturalization of meaning and communication at large. In the act of using linguistic expressions there are intentional and normative elements related to the correctness of use of a given name in a given linguistic society.

It is worth highlighting that the causal theory of reference is an acceptable form of naturalism within the natural language semantics. It is an attempt to naturalize the semantic characteristics of linguistic expressions. Therefore, on its grounds one may try to naturalize the entire process of communication. The causal theory of reference explains the mechanism of the transmission of meanings when they are identified with truth conditions which are an important advantage as regards frequent requirements so that the theory of meaning be related to the notion of truth. It also explains the transmission of semantic qualities as an expression used by the sender and receiver concerns the same object of reference as it is in the same causal chain of interrelations between the subsequent uses

of the said expression. By connecting particular users of the language within the course of a communication process it additionally meets the condition of individualism. As a result the explanation of an act of communication requires reference to individuals using the particular instances of this expression. Such a stability of the inheritance of reference relations stems from the nature of causal relations and their objectivity.

6.   An attempt to naturalize information

Information is the other category that is by definition related to communication. The process of communication is often understood as conveying information. Therefore understanding the essence of communication should help in understanding what communication is. Existing definitions of information usually refer to Shannon's information theory. However, this concept does not say what information is, it is a concept of information measurement. Shannon's communication theory does not answer questions about the content of signals, what information they carry; it describes how much information they carry. It is a notion distant from the common understanding of information that is close to the notion of a message, meaning, knowledge and reference. This is why in a non-technical sense the concept developed by Fred Dretske[4] is more useful for the theory of communication. The concept is in conformity with the assumptions of naturalism and at the same time it concerns the semantic qualities of information – it is 'philosophically useful'. A philosophically useful theory of information should preserve enough of our common understanding of information to justify calling it the 'theory of information'. (*Precis,* 169)

According to him this theory presents "a probable and theoretically strong analysis of signals' information contents [...] that can be used for cognitive and semantic studies." (KFI, p. x)

Dretske refers to the common understanding of information and, although he acknowledges that the theory of communication "has been developed for other purposes", "the ideas covered in this mathematical disguise ... are applicable beyond the limited group of conditions required to apply a mathematician theory." (*Precis,* 179)

Dretske's information theory referring to interrelations (among other causal) assumes that the notion of information is based on an assumption that what happens in one part of reality is related to what happens in its other part. In the world in which natural relations are interwoven with metaphysical ones situations bring information. Information is of a relative character, based on the interrelations between the elements of the world. Dretske believes the phenomena of information

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[4] F. Dretske, *Knowledge and the Flow of Information*, MIT Press, Cambridge 1981 [further – KFI]; *ibidem*, Précis of *Knowledge and the Flow of Information*, "Behavioral and Brain Sciences" 1983, vol. 6. Cf.: D. Israel, J. Perry, *What Is Information?*

origination and flow are lawlike, they show nomic regularities and undergo constraints. Therefore we can talk that one event carries information about other event. (*Precis*, 172)

According to Dretske there are "deep connections between representational systems and information-processing models of human cognition". In this model a human being is an element in the chain processing signals of the same informative content. This chain is, by its nature, a chain of causal dependencies. These interrelations are the base for the communication process, i.e. the transmission of information and knowledge that according to Dretske is significantly related to the concept of information.

Dretske gives an alternative model of knowledge understood as an information-produced belief, i.e. knowledge is a belief that is caused by or causally supported by information. This relation is specified in the definition of knowledge, where:

> K knows that s is F =def K's belief that s is F is caused (or supported) by the information that s is F.

The important characteristic of information understood in such a way is dynamics related not only to the very process of generating but also to the acts of transmission. Information – as Dretske writes – is "something whose generation, transmission, and reception do not require or in any way presuppose interpretive processes" (*Precis*, 174) He believes that may be transmitted, transferred by instruments, tools, computers and neurons. Dretske highlightens that there are rules of the information stream which govern the information flow in different acts of communication. These rules preserve one of the characteristics of information i.e. its objectivity. It is guaranteed by objective regularities of nomic character constituting a relation between a source and a signal and this relation is an essence of information. Information given by a fact is not its internal characteristic but a relative characteristic.

In sending information it is important that the copy of a carrier is a copy that is somehow related to the initial carrier and inherits the indication. In some cases though storage and transmission of information involve changes of both a carrier and properties of indication: a photo may be digitalized and processed into sound waves, sent by transmitters, received by a satellite, etc.

The notion of a content of information is crucial for the analysis of communication process. According to the definition of the content of information provided by the author, the state in which *s* being F always has contents with certain positive information of defined content. Its more detailed form is:

> A signal *r* carries the information that *s* is F =def if and only if the conditional probability of *s's* being F, given *r* (and *k*) is 1 (but given *k* alone, less than 1) (KFI, 65)

Dretske defines "k" – the key, however mysterious, element of the definition as follows:

"If an r signal carries information that s is F depends, among other, on what the speaker already knows about an s object." (*Precis*, 174)

Such dependency of information content on knowledge results from the fact that Dretske "relativizes this information to what (if at all) the receiver already knows about the possibilities of the source". However, he also stresses that "this relativization does not undermine the essential objectivity of the relativized product " (*Precis*, s. 174)

He notes that for the majority the relativization is not essential as most subjects would always share the common knowledge about the possibilities existing at source. It is worth stressing that he does not provide any argument for this statement. And this is a strong statement, as it claims that if a signal carries information at all depends on the background knowledge of the subject.

In defence of the objectivity of information (content) understood this way, one may assume that the observer's reference frame determined by the physical dependencies determines what information he may receive. This is objective however relative to the observer: everybody would receive similar information. This results from the objective character of dependences joining the source and the signal. On dependencies between them, especially these of regular character (nomic) – causal dependencies – the information and its content is based. Therefore, according to Dretske, this additional source of relativization does not influence the objectivity of the information received.

Informative content of a fact may relate to objects distant from the ones contained in a fact. Information contains a fact indicating the manner in which things are somewhere and sometime. This is why information is useful and interesting.

7. Summary

In a summary it is worth noting just a few assumptions which, if fulfilled, may get us closer to thinking about the communication process in a naturalistic way.

The first problem concerns the very notion of communication. If it is defined accurately enough, it is easier to determine the basic notions. In the proposed understanding of communication these notions are meaning and information. However for communication it is a language and the subject of communication that are more basic notions. Since the task is an attempt to naturalize the communication process then it is necessary to adopt such concepts of a language and subject that are compliant with naturalistic ways of their understanding. Therefore, the individualistic understanding of a language is adopted (Noam Chomsky's concept) and individualistic understanding of the subject of communication (communication takes place between individuals, on individuals' level).

The second problem is how naturalism is understood in different sciences. Discussion over the way of understanding naturalism leads to a position that is a version of non-reductionist physicalism.

This position makes it possible to adopt physical dependencies (causal included) as a basis of the world without limiting the levels of world organisation to just this physical foundation. It also assumes the methodological pluralism necessary to investigate the developing complex systems supervening physical reality.

Yet another problem is related to the naturalistic understanding of meaning and information. Causal reference theory formulated in opposition to the descriptive theory of meaning has been presented as the theory of meaning that may, to some extent, meet the conditions of naturalization. The causal reference theory refers to the natural relations between the elements of language (physical examples of expressions) and elements of the non-language world. This relation is of causal nature. This theory, although solving many problems of the descriptive theory, meets other problems that hinder (make impossible) the realization of a program of naturalization of semantics. Dretske's concept of information provides naturalistic explanation of another important category such as information. It also refers to causal (natural) dependencies in the world, existing in different situations, states, between the source and a destination of signals. It introduces the semantic measurement (and not only quantitative) to the notion of information; it also includes notions useful in the analysis of information process, such as information content, flow of information and relativization retaining its objectivity and independence from its carriers.

If it is possible to formulate the understanding of a communication process so that this notion is linked to how naturalism is understood in different sciences and also to determine categories of meaning and information basic for communication and in compliance with naturalism, then the program of naturalization of the communication process could significantly be coherent with naturalistic assumptions. This would let linking many areas of human activity related to communication, transmitting information and meaning to many researches in natural sciences.