

## Abstract: Tellurian cognition and interstellar communication

David Dunér, Associate Professor, Lund University, Sweden

My main question here is: What will happen to human cognition when humans receive an interstellar message or try to communicate with beings from a totally different environment, physically, biologically and culturally; an extraterrestrial environment that the human brain is not accustomed to and developed for? In short, could communication be possible between intelligent beings of totally different evolutionary and cognitive histories? Thus my argumentation starts from a fundamental, basic premise: The human brain has developed through an evolutionary process here on earth, with its specific environment. The human brain is adapted to the mind and culture of the tellurian species *Homo sapiens*, to understand and interact with other beings of our species, to understand human feelings, thoughts, motives, etc., in a psychological and sociological interplay that forms our human culture. This fact is crucial for future interstellar communication. I believe that cognitive science can give clues to how we might interpret and formulate interstellar messages.

Communication is situated in and constrained by its surroundings. Language has an evolutionary history and has evolved due to its enhancement of communication between humans, used for describing the world around us, but perhaps more importantly as a social interplay: to express feelings, for socializing and creating bonds, etc. Cognitive linguistics aims to situate language within more general cognitive capacities. According to John Taylor, language can be understood as a set of resources that are available to the language user for the symbolization of thought, and for the communication of these symbolizations. The reference of a symbol is a detached representation; the symbol refers to the inner world, in contrast to the signal that refers to something in the outer environment. Symbols are conventional signs, or arbitrary as Ferdinand de Saussure called them, dependent of culture. We may figure out the reference of the signal, but will probably have severe problems understanding extraterrestrial symbols. Cognitive semiotics, that deals with our use of signs, symbols, etc. for communication between humans, will I believe have great importance for interstellar communication.

Can we understand a message from outer space? Are we able to recognize it at all as an intelligent message? The first problem that arises in this situation of interstellar communication is realizing that it really is a message at all, as Göran Sonesson has pointed out. Some regularity and order, finding a repetition in the pattern, is not enough. We have to understand that someone has an intention with it that we should understand as a message. Next comes the problem of deciphering what the message means. Cultural semiotics, developed among others by Yuri Lotman, studies sign systems and the correlations between different systems. In order to understand a message the receiver must be able to fill in the gaps between the receiver's perception of the message and the sender's intention with it. The problem is that the creator of the message and the receiver of it are situated in different and specific cultural and social contexts. Relating to interstellar communication, this gap will be huge, with totally different ecological and cultural contexts. As Douglas A. Vakoch clearly states: "In the absence of knowledge of physical and cultural clues, communication between two species can be almost impossible." If we want to formulate a message comprehensible for an intelligent extraterrestrial we must, as also Sonesson has stated, go beyond our specific human biology, ecology, and culture. Designing a language for cosmic intercourse, like Hans Freudenthal's *lingua cosmica*, will probably be in vain. The famous Pioneer plaque now traversing deep space is also too firmly restricted by human culture and cognition, and will most likely be incomprehensible for an extraterrestrial. Even though the aliens would be familiar with the same kind of mathematics, chemistry, or physics as we are, to the content, their expressions of it would probably not be the same as ours when our life-worlds are different. The aliens and ourselves live in different cognitive or, if you wish, semiotic worlds with ways of thinking and signification that are not in agreement with each other.