

Wide Cultural Communications in Interstellar Messages

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Abstract. The idea of communicating cultural concepts in a SETI message, suggesting that analogy may be a useful tool, is developed in this paper in a systematic way, aiming at the construction of an effective message with wide cultural content. Here, I discuss both materials and methods in relation to three questions. Firstly, which of the main concepts of our culture are likely to be communicated in this way? Secondly, is the conceptual cluster (Dutil, 2004) sufficient as a basis to apply the analogical methodology or should it be extended further? And lastly, what is the possible contribution of the different kinds of logic (i.e. classical, mathematical, fuzzy and so on) and which are their relationships (if any) with analogy?

1. Introduction

Since the “pioneer age” of Lincos (Freudenthal 1960) and Drake’s Arecibo Message (Drake et al 1972), the field of interstellar message construction (ISMC) has progressed substantially. Two much more systematic messages have been constructed and sent, both from the Evpatoria Planetary Radar: the “Evpatoria Message” by Dutil & Dumas (Dutil 2004), and the “Teen-Age Message” by Zaitsev. In addition, a workshop on ISMC was held in Toulouse, France in 2001 (Musso 2002), followed by another in Paris 2002, devoted to art.

Although ISMC is expensive and difficult, there are several good reasons for doing it. For example, it can be argued that doing so prepares us in advance in case we receive a SETI communication, or that it is an enterprise that may teach us about ourselves. However, the primary reason is as follows.

It is widely agreed that any message sent to an extra-terrestrial civilization should be sent “on behalf of the whole of mankind”, although there is no agreement on any process for constructing such a signal. However, since two messages have already been sent (the Evpatoria and the Teen-Age messages), neither of which attempted to represent the whole of mankind, it is very likely that if an ET signal were detected, there might be several individuals with access to a radio-telescope who would begin transmitting a personal signal with no consultation (Sterns 2002). The only way to avoid such a catastrophic scenario is to have an international reply ready, shared by as many people as possible.

2. Message Format

Messages that have so far been sent consist of a number of “pages”, each of which consists of a train of pulses. The number of pulses on each page is the product

of two prime numbers. This format has proved to be suitable for science and mathematics, and may also be suitable for conceptual knowledge. A number of improvements have been suggested to this basic format to improve its robustness to signal loss or low signal-to-noise ratios. These include:

1. Putting a “frame” around each “page” (Dutil 2004).
2. Marking each “page” with a page number (Dutil 2004).
3. Use only symbols complex enough to minimize the possibility of misunderstanding (Dutil 2004). For a signal-noise ratio of 10, a symbol consisting of at least 35 pixels, differing from other symbols by at least 7 pixels, should be recoverable.
4. Using redundancy (Dutil 2004).
5. Avoiding special symbolism. Constructing a special set of symbols for an ET message makes it more difficult for us to encode the message while offering the recipient no advantage over our current alphabet.

3. Message Content

Most discussions on ISMC have assumed that messages should be based on mathematics, logic and science, because these are based on the laws of nature and therefore should be the same everywhere in our universe (e.g., Dutil 2004). However, such information may not be very interesting for an advanced civilization who receives the message. Thus we must explore ways of constructing a message about our culture. I contend that the most interesting aspects of our culture would be religion, ethics, philosophy and art. We may also speculate that politics and economics may be interesting if the “Galactic Club” hypothesis (Bracewell 1975) were to be confirmed, but I do not pursue that at present.

While many agree that ISMC should be a common enterprise of the whole of mankind, at present message construction is undertaken only by proponents in a few Western countries. Thus, message construction is currently not representative of all of mankind. I therefore propose that we should construct a message about our “Western” culture, and establish a methodological framework and an example. We may then invite representatives of other cultures to use this formalism to construct messages about their own cultures.

I suggest that, on Earth, art is the most universal cultural product, and is easier to communicate across cultural boundaries than religious and philosophical beliefs. However, this may not be true when communicating to alien species, because art is based mainly on sensations, while religion and philosophy are based on concepts. Communication with different species may be easier through abstract concepts which are independent of human sensations (Musso 2002).

Visual and musical art can clearly be communicated in a digital format, using a representation of wavelength for the colour or note at each point in space or time. However, to obtain adequate resolution of the work of art, such a message will generally be longer than those usually considered for ET messages,

making the message less robust to noise. However, an alien species may be sensitive to different wavelength ranges, rendering our art meaningless to them. A possible solution is to send information about our sensory apparatus, to enable them to make a comparison (Clar 2004). Literature as an art form is probably even more culture-dependent. Only the complete reception of Heidmann's "Encyclopaedia" (Heidmann 1993) might enable aliens to appreciate literature.

4. Message Format: Integrated Language and Analogy

I have previously argued that ISMC should use an integrated language, consisting both of logical-mathematical formalism and of pictures. The first formalism is appropriate for communicating mathematical, science and some abstract concepts, while the second is appropriate for describing the material features of our world. The combined use of these two formalisms enables the communication of our main higher-level cultural concepts. This must be done progressively, starting with simple concepts associated with the material world and then building on this to communicate more abstract reasoning by using analogies.

5. Conclusion and Further Work

Further work is now needed in order to identify our basic concepts in the cultural fields we want to communicate. The next step will be to optimize the organization of our conceptual framework, shortening it as much as possible and minimizing the number of original concepts we need to introduce, in order to make our message as simple, economical and robust to noise as we can. Axiomatization and computer programming (McConnell 2003) may well help us in doing that.

Finally, we need to determine whether the conceptual cluster provided by Dutil & Dumas (Dutil 2004), is a suitable basis to make cultural concepts understandable to aliens, via analogical reasoning, or whether it needs integration.

References

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