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PARAINFORMATION AND CULTURAL STRUCTURE DEVELOPMENT

Abstract

Creative communication is the basic mechanism of the development of human spirituality. However, it can also produce spurious cultural structures that do not reflect their apparent subject area. Such structures still correspond to certain objective phenomena, though of a different nature, namely, the dynamics of mass psychology. Although most spurious structures are bound to dissipate with more social experience and wider education, they may live for centuries, living deep traces in human mentality and thus influencing cultural development.

In an earlier report, I introduced three levels of communication associated with different types of information transfer or production: passive communication, elliptic communication, and creative communication [1]. The latter two cases involve parainformation, that is, communicating something without physically transmitting it through the communication channel [2]. The receiver is assumed to be able to restore the missing components of the message using the common decoding schemes established in the current cultural context. If such decoding is successful, parainformation only differs from direct information transfer in that the low-level traffic becomes significantly reduced due to effective redundancy elimination on the basis of socially established data processing standards. This technique is widely used in computer technologies and telecommunications, but it is also of a key importance in spiritual culture, including the arts, science and philosophy.

Parainformation is intimately related to hierarchy. It implies simultaneous communication at several levels, with only one involving physical data transfer. This is how computer networks operate, with a higher-level protocol like HTTP or FTP built upon a lower level (TCP/IP). In conscious communication, the lower and higher levels determine the meaning and sense of the message respectively [3,4].

However, in many cases, parainformation fails to correctly communicate the intended content, and the decoded message may significantly differ from the original. While parainformation is weakly dependent on the level of statistical noise, which is the main source of errors in passive communication, systematic errors can be introduced due to the incompatibility of encoding and decoding devices, or incorrect selection of communication protocol. For instance, a Web browser that has not been configured to recognize certain document formats (e.g. a Lotus 1-2-3 table) will try to render it as utterly unreadable plain text. Similarly, if HTML page encoding is not specified in the document header, or the necessary coding tables are not installed, the browser may be unable to display anything comprehensible, despite that no low-level information has been lost at physical transmission. In this case the decoded message is inconsistent, and the whole transaction fails. In more complex situations, the receiver will be able to interpret the message, and it will be apparently consistent, but the resulting behavior on the receiver's end would be directed in a quite unexpected route. Thus, a single Lotus Notes database can be successfully replicated, but if replication failed on another database that is invoked from the former by the application logic, the results may be unpredictable. In humans, due to the high selectivity of perception, this is a normal situation, when only a part of relevant data may become noticed, and the activity gets turned in an unintended way.

There are special social mechanisms to correct deviations and verify the completion of higher-level transactions, but there are also cases, when parainformation results in significant cultural shifts.

Indeed, let us recall the history of the Martian channels. First observers had low resolution telescopes, and they could only see a gross pattern on the surface of Mars, which looked like a web of thin lines to them. Combined with the dreams about life on other planets, this produced an idea of channels on Mars, probably the traces of civilization. People spent nights attempting to discern more channels, and drawing detailed maps. They tried to imagine the civilization that could build them. Even today, long since it has been proven that there are no Martian channels at all, and no conscious life, some people invent fictions to reconcile that knowledge with the pictures of former high civilization on the red planet.

To suggest an actual example, consider modern ufology. There are hundreds of "scientists", who try to interpret anything they find unusual from the viewpoint of possible contacts with extraterrestrial civilizations. There are institutes and academies, journals and PhDs... They collect case studies that can hardly be considered as scientific evidence, but which are presented in a science-like manner, pretending to provide an empirical basis for further generalizations. Even knowing that most such data are irrelevant to the problem, and many are faked, people still are apt to believe that such activities might report on at least a few true contacts, and hence the whole of ufology may make sense.

Many other similar examples can be provided: astrology, alchemy, numerology, clairvoyance, parapsychology, quantum information, or the so called cognitive science, etc. In politics, parainformation is used to manipulate the public opinion and control the democratic machine through properly filtering the information the people may have. This allows mass actions that may change the face of the whole planet, though, of course, the laws of economy will always outline the mainstream of cultural development.

However, not all parainformation is of a negative sort. Thus, the description of the characters in belles-lettres is necessarily very scarce; still, the reader can get a quite vivid picture of a person by only a few carefully selected and demonstrated traits, restoring the rest from one's social experience. Prose could not have existed without that. The more so with poetry, where the usage of inspiring word combinations is the only available mechanism of communicating inner speech.

In psychology, one's personality is formed from the variety of people's attitudes to the person, so that one's behavior is adjusted to person's image in the others' eyes. The society gives numerous hints on what is expected from the person, and these hints allow one to build one's own internal hierarchy, either in accordance with the prompts, or in spite of them. In both cases, an outer structure of social relations becomes reflected in an inner structure of the personality. Inversely, the perception of one person by another depends not only on the personality perceived, but also the socially determined forms of this perception, the collection of types recognized in the particular culture. In this way, people can perceive an artist as a personality distinct from any real person, and several authors can combine their personalities in a single fictitious character publicly known by a common alias (e.g. Kozma Prutkov).

A similar process occurs in cultural structure formation. The objective dependencies of the different areas of material production require definite social structures to support them; however, there is no direct determination of the latter by the former, and this structure projection is a kind of parainformation. The stability of thus induced structures depends on the adequacy of reflection, and the structures that are not supported by the appropriate schemes of activity can only temporarily exist. However, human culture is a peculiar system that can develop new activities to preserve an earlier acquired habit. This "metaphorical" circulation of abstract information is possible due to the essential

diversity of human needs, and activity scheme conservation in abstract activities is a mechanism of cultural inheritance.

Indeed, any activity has both the productive component, directed to satisfying certain social needs, and spiritual component, accumulating the specific ways of human action and communication within that particular activity. When the material basis of the activity is removed, with newer technologies coming up and the structure of needs changed, the communicative and operational structures formed in that obsolete activity can only be preserved if some other activity is found that could be actualized using the same actions and operations, but for a different purpose. Typically, this scheme transfer involves shifting motives to goals, as a standard mechanism of activity commutation [5].

Commonly, the skills necessary for an obsolete activity become distributed between many other activities, which are similar to the original in some respects. Scheme transfer does not to occur between the same levels of different activities, and it is not restricted to only the highest level. In this way, the humanity preserves any cultural phenomenon at all, even with no material traces left. If necessary, such dispersed elements can be brought together, to restore their common origin; in particular, this allows an archaeologist to guess how the early people used strange things that are found during excavations.

In this process, a formerly productive activity may also become a kind of play, pretending to do something, while actually centered on the very way of doing it. Many games originate from some earlier activity that once served a vital necessity, but lost its cultural significance since then.

Since changes in the motivation structure influence the schemes of activity, scheme transfer is inevitably a process of abstraction, retaining the original structures in a folded form. However, such an abstract behavioral pattern is enough to unfold a corresponding productive activity in the conditions that demand technological regress. In cultural development, special activities get formed that are entirely dedicated to producing abstractions of different kind. Art, science and philosophy are three such cultural formations. They use different means of abstraction, but they all can serve as a kind of historical memory.

But the abstract scheme transfer is not only useful for cultural inheritance. Abstractions can be combined in an abstract way, producing schemes that have never ever been associated with real activities. Such schemes may exist within the sphere of spirituality for quite a long time before they become applicable to some branch of material production. That is, through abstract activities, the humanity prepares itself for its future. The spurious cultural structures entirely based on parainformation thus become an important stage of cultural development. Thus, alchemy made a most valuable contribution to the development of chemistry, and astrology stood at the cradle of modern astrophysics... It is only artificial conservation of primitive schemes in a much more developed cultural environment that makes their cultural effect negative.

In general, the role of any cultural structure is determined by the cultural context, the relation to a number of other structures. On the example of musical scales, it has been earlier demonstrated how the function of the same musical tone changes in respect to different zone scales, and how simpler scales become embedded in more complex scales in historical development [6]. Musical pitch perception is hence entirely based on parainformation, while the lower-level pitch perception employs traditional information measures for evaluating the differences between elementary perceptions. This approach has also been extended to the visual arts [3], and the universal role of zone scale formation in cultural development has been conjectured [7]. Following this line, I put forth the hypothesis that the very distinction of stages in cultural development, as well as distinct cultures, can be characterized with similar zone structures, ordered in historical time. This is related to the problem of stages in

individual development, and the necessity to extend the original Piagetian categorization [8]. The detailed description of this essential discreteness of historical development is yet to be done, but it will certainly be based on comparing different levels of social communication and hence the logic of parainformation will be necessarily involved.

References

1. P B Ivanov "Art as creative communication" *Interaction between Man and Culture: Information Standpoint* Proceedings of the International Symposium (Taganrog, Russia, 1998), v. **1**, pp. 95–100

2. M Mazur *Qualitative Information Theory* (Moscow: Mir, 1974)

3. P B Ivanov "A hierarchical theory of aesthetic perception: Scales in the visual arts" *Leonardo Music Journal*, **27**, no. 5, 49–55 (1995)

4. P B Ivanov "Discreteness, continuity and hierarchical scaling in the arts" *Information Approach in Empirical Aesthetics* Proceedings of the International Symposium (Taganrog, Russia, 1998) pp. 66–77

5. A N Leontiev *Activity, Consciousness and Personality* (Englewood Cliffs, NJ: Prentice Hall, 1978)

6. L V Avdeev and P B Ivanov "A mathematical model of scale perception" *J. Moscow Phys. Soc.*, **3**, 331–353 (1993)

7. P B Ivanov "Scale hierarchies and culture-historical universality" *Empirical Aesthetics: Informational Approach* Proceedings of the International Symposium (Taganrog, Russia, 1997), pp. 80–85

8. M L Commons, E J Trudeau, S A Stein, F A Richards, S R Krause *Hierarchical Complexity of Tasks Show The Existence of Developmental Stages* Developmental Review (1997)

http://unism.pjwb.net/arc
http://unism.pjwb.org/arc
http://unism.narod.ru/arc