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Dynamics of Information Images in the Mind of an Individual during Simultaneous Interpretation

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Abstract

This article reviews the dynamics of information images in the mind of an individual during the simultaneous interpretation from foreign language into Russian, as well as during a number of additional professional tasks (shadowing).

From the experimental point of view, using the technology of event-related telemetry (ERT) of heart rate, we investigated the features of mobilization of vegetative resources for a record-breaking activity in terms of energy efficiency and stressogenic load - simultaneous interpretation (SI).

The results have been analyzed from the point of view of the Information Images Theory. The main provisions of this theory are given along with overview of the hierarchy of information images in the mind of an individual, which determines his real and virtual activity.

This paper provides a model of the dynamics of information images in the mind of individuals during simultaneous interpretation.

Keywords: Communicative field, information image, the information images space, virtual particles.

1   Introduction

The problem that arises from the need to describe the processes of transmission and processing of information by an individual is fundamental to modern cognitive science. Relatively recently there appeared unique natural-science models of information transfer from an individual to an individual (Aleksandrov Y., 2011), and some others in other fields of biology and cognitive psychology (Ashby F. G., 2011) (Chernavskii D.S., 2009) and others. These methods have cleared a path to studying the physiological mechanisms of the individual stages of the information processing: sensory analysis, mobilization of attention, image formation, extraction of memory patterns, decision making, etc.

The proposed theory is based on the idea of the universal cognitive unit (Anohin, 1989) of the information in the human mind - the information image, a space, in which it exists, its topology and properties. Information images (hereinafter IIs) can be defined as the display of objects and events in any feature space.

Accordingly, the Information Images Theory (hereinafter IIT) can serve as a method of describing information interactions of individuals, as well as a number of cognitive functions of a person. Within the framework of the IIT we view the human mind as a great structured number of interacting images constantly being influenced by external factors (Petukhov & Polevaya, 2016).

From the point of view of cognitive loads, the activity of simultaneous interpreters is one of the most energy-intensive and stressful ones for the brain (Chernigovskaya T.V., 2016). Therefore, this type of activity can be indicative for recording the activity of information images.

2   Experiment

The experimental studies can be correlated with the IIT through the reaction time to the information perturbation (ie, impact) of the individual. The reaction time will correspond to the image activation time, i.e. its transition to a higher level in the II space. Therefore, we chose an experiment based on the information technology of event-related telemetry (ERT) of the heart rate (Polevaia, et al., 2016). A WEB-platform Apway.ru developed by our team was used for the study of cognitive functions. This platform provides a universal infrastructure for designing and conducting various psycho-physiological tests.

The idea of the experiment is as follows: interpreters working in succession performed professional tasks: shadowing the text in Russian, simultaneous interpretation of the text from foreign language to Russian, shadowing the text in a foreign language, simultaneous interpretation of the text from foreign language to Russian. In addition, before and after the professional activity, the interpreters were to pass the projective test to determine the level of emotional deconditioning (LED), the sensorimotor activity test and the Stroop test (10 subjects - Russian version, 6 - bilingual) using the Apway platform (Petukhov & Polevaya, 2016). During the whole experiment, a telemetric registration of the cardiointervalogramm was conducted to identify the features of the mobilization of vegetative and energy resources for all types of activities of interpreters and to determine the level of stress load induced by each type of activity. The following methods were used for the statistical analysis: ANOVA (method of repeated measurements) and correlation analysis.

Sixteen (16) simultaneous interpreters (13 women and 3 men, ages 21 to 28) took part in the experiments. Each test subject had been specifically trained (educated) for this kind of activity.

Monitoring the variability of RR-intervals in the process of experimental modeling of the professional activity of a simultaneous interpreter (Fig. 1) fully confirmed the widespread opinion about the high degree of its stress load.
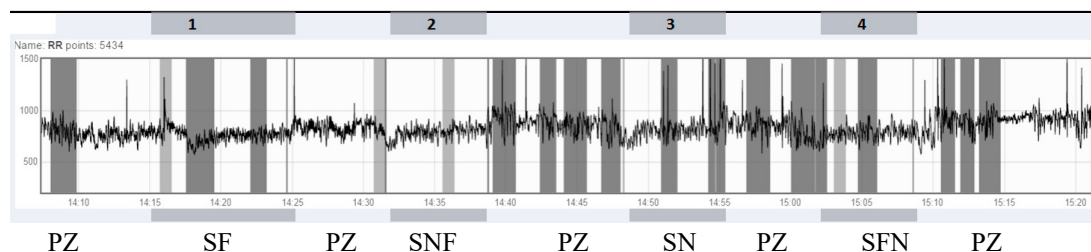

Fig. 1. A typical example of recording a cardiointervalogramm of a subject during two shadowing sessions (1 in German, 3 in Russian) and two simultaneous interpreting sessions (2 from Russian into German, 4 from German into Russian).

Abbreviations: STR - Stroop test (Russian version), STF- Stroop test (foreign version), SMA- sensorimotor activity test, LED- level of emotional deconditioning, SF- shadowing of a foreign text, PZ - pause in the activity, SNF- simultaneous interpretation from native language to foreign language, SN-