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ON TWO-CHANNEL DECODING OF EMOTIVE INFORMATION IN THE ACT OF FOREIGN LANGUAGE COMMUNICATION

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Two experiments were carried out to assess the ability of listeners to identify emotion features of verbal and non-verbal behaviour regarding foreign language communication. The experimental corpus (Talk-Shows of German TV) was analysed by two groups of informants (Russians and Germans) on the basis of two kinds of analysis: simultaneous and successive. Our analysis has shown that the decoding of emotional behaviour of speakers by native and non-native listeners has some differences. There are some differences regarding the kind of decoding channel too.

The middle and the end of the XX century were marked by a rapid increase of the number of applied research dedicated to the "human – machine" speech interaction (e.g. Potapova 1989; 1990; 1992; 1997). Above all the research was centered on issues related to formalization and algorithmization of auditory image discerning processes based on the material of isolated sounds, sound combinations, order-words, word-by-word articulated phrases. Later in connection with the development of high technologies the need for decision of "human – machine" interaction problems considering multilingual, multimodal and multimedial information appeared.

It is clear that research on the domain of "human – machine" interaction by the end of the XX century turned to lost of scientifically interests of the specialists in the area of fundamental and applied speechology.

At the same time considering homo sapiens as a complex biological system [Izard 1981] including a number of relatively autonomous subsystems (homeostatic, motor-motional, reproductive, perceptual, cognitive, emotive, regulative) for an in-depth study of the "human – human" interaction nature the functional-substantial stratification acquires special importance:

- speech behaviour (the simplest: stimulus – reaction, signal – symptom),
- speech activities (coding – decoding of verbal signs in a larger communicative format),
- textual activities (creation of an integral verbal product).

Such subsystems as motor-motional, perceptual, cognitive, emotive acquire special importance in this case [Potapova, Potapov 2006]. Studying "human – human" interaction, i.e., the process of interpersonal, interlingual and intercultural communication, one faces a compound problem – on the one hand, the problem of monosemantic decoding of the complex behaviour of the communication partner (an addressee) and on the other hand, the problem of semantic coding of information by the addresser, allowing centrifugal and centripetal character of physical and psychical control of speech production and speech perception in the act of communication leading to the necessity to insert the mechanisms of semantic assimilation and accommodation [Piaget 1947; Rothbaum et el. 1982].

The "human – human" interaction problem constitutes special complexity in the presence of such factors as "native language – foreign language" communication, affiliation to different ethnic cultures. In this connection we set a task of searching for key (basic) features of two-channel decoding (perceptual-auditory and perceptual-optical) of foreign language and other-cultural communication referring to the search of the solution of the verbal – non-verbal communication process modeling characterized in particular, by the final effect of interaction successfulness (consensus).

The experimental investigation under consideration was carried on for a number of years (2002-2006) step-by-step within the framework of the bilateral Russian-German project. Native speakers of Russian as well as of German were involved in this research. The experimental corpus for the research were different fragments of German TV-Talk-shows.

In the first stage of the research there were simultaneous performed two types of analysis – perceptual-auditory and perceptual-visual – which were based on the material of TS-fragments (time volume = 27 hours). In the experiment took part native listeners of Russian without knowledge of the German language and native listeners of German aged 18-22 (n = 35).

The two-channel analysis by listeners was made repeatedly and simultaneously (i.e. the audio- and video information was given at the same time), and included answers to the questions set in a special form* (see below).

Form №1

1. See a TS-fragment and recognize:
   1.1. number of participants
   1.2. subject of the TS
2. We ask you to recognize general emotional frame of the TS-fragment:
   2.1. neutral
   2.2. joyful-natural (free and easy)
   2.3. aggressive
   2.4. depressed (sad)
   2.5. agitated (strained, anxious)
   2.6. other types (correctly)
3. We ask you to recognize what means are used to express general emotional frame of TS-fragment:
   3.1. Intonation means
   3.1.1. melody
   3.1.2. tempo
   3.1.3. voice timbre ("clear", "toneless", mild (gentle)", acute etc.)
   3.1.4. pauses
   3.1.5. loudness
   3.1.6. other types (specify)
   3.2. Face and body gestures
4. Try to recognize what stress features (if there are any) are related to:
   - verbal (in particular, intonation)
   - non-verbal (in particular, face and body gestures)

General emotional communicative frame and also the participants had to evaluate with specific contribution of each characteristics just listed.

In the first stage of this research the following conclusions were obtained:

- The two-channel simultaneous (perceptual-auditory and perceptual-visual) decoding of identical authentic experimental material in German by Russian and German native listeners is characterized by certain discrepancy.

- For the Russian native listeners distribution of subjective evaluations regarding the prosody coding is the following: melody and melody with additional perceptual features (60%), tempo (20%), loudness (13%) and pauses (7%).

- For the German native listeners was other distribution: voice timbre and timbre with additional perceptual features (73%), melody (20%), tempo (7%).

The general structure of divergence of the data received for both groups of informants is the following:

- The same communicative frame, taking into consideration emotionally volume and its emotive evaluation, is being decoded by auditors differently: German listeners evaluation estimated as "neutral" corresponds with Russian listeners evaluation estimated as "excited", "agitated", "aggressive".

- For Russian listeners such characteristic as "neutral" seems not to be main for decoding, when for German listeners would be main feature.

- The feature "agitated" for German listeners corresponds with the feature "joyful" for Russian listeners.

- General emotional frame decoding of all experimental material for the Russian native listeners is characterized by a wide variety of subjective evaluations including "semi-tones" and "nuances".

* The research included emotional and emotionally neutral material as well. In this stage in the experiment Ph.D. E.B. Yakovleva took part in the experiment.

- The basic feature for emotive decoding of German speech by Russians is melody itself or melody as a component in complex with other features. And vice versa emotive decoding of native speech by German native listeners is realized by means of voice timbre.

- Comparative analysis of results of the two-channel simultaneous decoding of foreign communication gives the opportunity to maintain that Russian listeners who don't speak German while defining general emotive frame in the process of foreign language communication use non-verbal information as supporting (39%) and paraverbal (paralinguistic [Potapova 1997]), in particular prosodic information as additional.

In the second stage of the research conditions of the experiment were changed. The participants of experiment were provided with new experimental material: TS-fragments from TV-programms selected by German colleagues with business or less emotional /sachlich kooperative Kommunikation/ communication (n = 6, time volume – 9 hours). Native speakers of Russian who don't speak German and haven't participated in any experiments earlier were taken as informants (n =15).

The experimental material was presented to the informants successively (i.e. in series):

a). visual series

b). audio-visual series

The questionnaire was greatly extended (see form № 2).

Form №2

1. See TS-fragment and recognize:							
		1	2	3	4	5	6
1.1	number of participants						
1.2	number of men						
1.3	number of women						
1.4	subject of the TS (the main problem of discussion)						
A)	business						
B)	entertaining						
2. We ask you to recognize general emotional frame of the TS-fragment:							
2.1	neutral						
2.2	friendly (joyful-natural)						
2.3	agitated (strained, anxious)						
2.4	depressed (sad)						
2.5	aggressive						
3. We ask you to recognize what means are used to express general emotional frame of TS-fragment:							
3.1	intonation means						
3.1.1	melody						
3.1.2	tempo						
3.1.3	voice tinge (clear, toneless, "mild (gentle)", acute etc.)						
3.1.4	pauses						
3.1.5	loudness						
3.1.6	regular rhythmic						
3.1.7	non-regular rhythm						
3.2	face and body gestures						
3.2.1	face motions						
3.2.2	eye expression						
3.2.3	active hand gesticulation						
3.2.4	moderate hand gesticulation						
3.2.5	absence of hand gesticulation						
3.2.6	body movements						
3.2.7	absence of body movements						
4. We ask you what means are used:							
4.1	intonation (paraverbal) means						
4.2	speech (verbal) means						
4.3	Both intonation and speech						

Statistical data analysis has shown:

- Evaluations of emotive information in a successive way of representing foreign language material practically coincide. At the same time transferring to sounds we observe a tendency toward more precise recognition of decoding features.
- Presence of pauses is estimated quite unequally, that from our point of view can be related to the absence of semantic information, seeing that the listeners decoded spoken foreign language perceptually without knowledge of the analyzed language.
- Along with appropriate evaluation of prosodic means (melody, timbre, level of loudness, rhythm etc.) the listeners in this stage with a high degree of accuracy managed to recognize timbre features, in particular with elements of differentiation of men and women voice timbre specificity.
- With a high degree of accuracy the participants of the experiment decoded non-verbal information (100%).
- The results of successive perceptual-auditory and perceptual-optical decoding of emotive information as a whole coincide with the results of simultaneous decoding. However successive decoding is characterized by a greater degree of accuracy, reliability and detailed elaboration.

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