

Ferdinand Knobloch; Jaromír Juna; Hana Junová; Zdeněk Koutský  
On an interpersonal hypothesis in the semiotic of music

*Kybernetika*, Vol. 4 (1968), No. 4, (364)--382

Persistent URL: <http://dml.cz/dmlcz/124399>

## Terms of use:

© Institute of Information Theory and Automation AS CR, 1968

Institute of Mathematics of the Academy of Sciences of the Czech Republic provides access to digitized documents strictly for personal use. Each copy of any part of this document must contain these *Terms of use*.



This paper has been digitized, optimized for electronic delivery and stamped with digital signature within the project *DML-CZ: The Czech Digital Mathematics Library*  
<http://project.dml.cz>

## On an Interpersonal Hypothesis in the Semiotic of Music

FERDINAND KNOBLOCH, JAROMÍR JUNA, HANA JUNOVÁ, ZDENĚK KOUTSKÝ

Is music a sort of non-verbal language conveying meanings to listeners? In this article, one part of this old controversial subject is approached experimentally. Reasons are given for the hypothesis that the works of music signify interpersonal tendencies which are understood and reacted to by the listeners who in this way participate in fantasy on the interpersonal transactions of the composer. Some links are shown which connect the present problem with semiotic, general systems theory, psychology both normal and pathological, psychoanalysis and ethology.

### 1. INTRODUCTION

The problems of the meaning of music have puzzled musicians and students of aesthetics, psychology and philosophy for several centuries, but coordinated interdisciplinary studies have been lacking. And, in fact, such studies seem essential for any progress in this difficult field.

The confusing diversity of views can be demonstrated by many examples, but only two contrasting opinions, that of R. Wagner and E. Hanslick, will be mentioned here as representative for many others. This is the opinion of R. Wagner:

“What music expresses, is eternal, infinite and ideal; it does not express the passion, love, or longing of such-and-such an individual on such-and-such an occasion, but passion, love or longing in itself, and this it presents in that unlimited variety of motivations, which is the exclusive and particular characteristic of music, foreign and inexpressible to any other language!” (Quoted from [3].)

Devoid of the romantic phraseology, what Wagner wants to say — according to the interpretation of S. Langer [3] — is that music is not self-expression, but formulation and representation of emotions, moods, mental tensions and resolutions — a “logical picture” of sentient, responsive life, a source of insight, not a plea for sympathy.

On the other hand, E. Hanslick declares that music does not convey any meaning whatever:

“It is no mere fencing with words to protest most emphatically against the notion of ‘representation’, because this notion has given rise to the greatest errors of musical aesthetics. To ‘represent’ something always involves the conception (*Vorstellung*) of two separate, distinct things, one of which must first be given, by a specific act, an explicit relation of reference to the other.” (Quoted from [3].)

There has been no basic change till the present time. There are some who deny that music conveys any meanings at all – Richard Rudner, Kingsley Price, Abraham Kaplan, Charles Stevenson, according to Morris [9]. On the other side of the fence, there are those who contend that music has some meaning, but they hold most varied opinion what constitutes its meaning and how it is communicated. Heated polemics have been no exception.

According to B. Meyer [5], the different views of the present time can be classified according to two dichotomies. The first one is the *absolutist-referentialist* dichotomy: Whereas the absolutists insist that musical meaning lies exclusively within the context of the work itself, in the perception of the relationships set forth within the musical work of art, the referentialists contend that, in addition to these abstract, intellectual meanings, music also communicates meanings which in some way refer to the extra-musical world of concepts, actions, emotional states, and character. The second dichotomy is the *formalist-expressionist* one. According to the formalist view, the meaning of music is primarily intellectual and lies in the perception and understanding of the musical relationships set forth in the work of art; according to the expressionist view, these same relationships are in some sense capable of exciting feelings and emotions in the listener. As Meyer says, expressionist position must not be confused with that of the referentialist: “Thus when formalists, such as Hanslick or Stravinsky, reacting against what they feel to be an overemphasis upon referential meaning, have denied the possibility or relevance of any emotional response to music, they have adopted an untenable position partly because they have confused expressionism and referentialism.”

It is doubtful whether the terms like “to refer”, “intellectual meaning”, “emotional meaning”, etc., have the same meanings for everybody who uses them, and whether they are clear enough to anybody. Therefore, it seems imperative, before starting any serious attempt to solve the problems in question, to study the language used. This is, however, an immense task and it is not intended here to deal with these problems in their complexity. This article will deal only with a small part of the vast field – however important it may turn out to be – namely, with the hypothesis on the interpersonal meaning of music. But even so, it is not possible to avoid the considerations of the analysis of language completely, and some basic terms of semiotic (the theory of signs) will be introduced. In this, Charles Morris’ work will be followed rather closely, as he paid in it equal attention to all sorts of signs- not only to those of scientific language as the most others, like Peirce and Carnap, did.

To describe *semiosis* (or sign behaviour or sign process), 5 basic terms are necessary: "S" ("*sign*"), "I" ("*interpreter*"), "It" ("*interpretant*"), "Si" ("*signification*"), and "Co" ("*context*"). In semiosis, S sets up in I the disposition to react in a certain kind of way, It, to a certain kind of object, Si (not then acting as a stimulus), under certain conditions, Co.

Several other terms will be introduced. Anything which would permit the completion of the response-sequences to which the interpreter is disposed because of a sign, will be called a *denotatum* of the sign. Whereas all signs signify, not all signs denote. (E.g., "Centaur".)

A particular physical event — such as a given sound or movement — which is a sign is called *sign-vehicle*. For the study of arts including music, the *iconic* signs are of special importance. A sign is iconic to the degree to which it would denote any object having certain properties it possesses itself (i.e., its sign vehicle possesses). For example, the onomatopoeic word "cuckoo" is an iconic sign, because when spoken resembles the sound produced by a cuckoo. The iconic signs are important in arts, since- in virtue of their similarity to their denotata — they may highly activate in the interpreter his dispositions to respond and partially satisfy the needs aroused. It may well be, as the psychoanalysts would contend, that the iconic signs can be used as the substitute objects for satisfaction of needs by interpreters who are not aware of this process (as these needs are conflictful, especially if some of them are morally forbidden).

In classifying signs, Morris follows G. H. Mead in his description of three phases of action: the *perceptual*, the *manipulatory*, and the *consumatory*. If an impulse (as a disposition to a certain kind of action) is given, the organism must perceive the relevant features of the environment in which it is to act; it must behave toward these objects in a way relevant to the satisfaction of its impulse; and if all goes well, it then attains the phase of activity which is the consummation of the act. Morris distinguishes three dimensions of signification corresponding to the three phases of an act: *designative*, *prescriptive*, and *appraisive*. These three dimensions are potentially present in every sign, but often one dimension prevails. A sign is *designative* insofar as it signifies observable properties of the environment or of the actor; corresponding to the designative dimension of signification, the interpretant would be a disposition to react to the designated object as if it had certain observable properties. A sign is *appraisive* insofar as it signifies the consummatory properties (positively or negatively reinforcing, satisfactory or unsatisfactory) of some object or situation; the corresponding interpretant would be a disposition to act towards a designated object as satisfying or unsatisfying. A sign is *prescriptive* insofar as it signifies how the object or situation is to be reacted to so as to satisfy the governing impuls; the corresponding interpretant would be a disposition to act in a certain kind of way to the designated object or situation.

Morris does not introduce the term “*meaning*” as a basic term for semiotic, because it has variety of significations in common usage. It can be best understood as both the signification and the interpretant of a sign. E.g., the term “good” would have therefore appraisive meaning only if it not merely signified an object as having satisfactory (positively reinforcing) properties, but also aroused as its interpretant a disposition to preferential behaviour towards the object signified.

For the present topic, the term “*express*” is of importance. A term may be called “*expressive*” to the degree that its production is itself taken as a sign by an interpreter of some state of its producer. It must be stressed that what is expressed need not necessarily be an emotion.

In the light of what has been said, it would not seem sound to take the differences of opinions between the referentialists and the absolutists at their face value. Rather, it seems advisable to try to translate such terms as ‘to refer’ into the basic terms of semiotic. If ‘refer’ is synonymous with ‘to signify designatively’, there may be general agreement that not all music ‘refers’ to something. But the answer may be quite different, if in the term ‘refer’ the appraisive and prescriptive dimension is also included. Further, it should be clear whether the term ‘to refer’ means “to signify” or “to denote”. For example, if we describe a product of our fantasy, the description is a sign and has its signification, but it need not to denote anything.

At the end of this chapter, it should be mentioned that Ch. Morris uses the term “*semiotic*” for the field of the theory of signs as a whole, following the example of the Greek Stoics, John Locke and Charles S. Peirce. *Syntactics*, *semantics* and *pragmatics* are conceived as three branches of semiotic.

### 3. THEORETICAL BACKGROUND

Until recently, behaviour sciences dealing with animals and men largely neglected to study the organisms in their mutual interactions. Although these interactions are important almost in all species, only in two or three, like in ants and bees, the social organization was studied to some extent [13]. And also human psychology, both normal and abnormal, heavily biased by introspectionism, was to a large extent an individual psychology. Only at present some attention has been turned to groups of organisms conceived as systems in equilibrium, and fine social monitors and feedbacks are being discovered [11].

#### 3.1. Small social groups

Students of primates, our next relatives, are quite definite about the importance of social life for survival of the species. What S. L. Washburn et al. [12] have to say about baboons, is no doubt true also about our predecessors in the process of becoming human: “Once an animal is separated from the troop the chances of death are high.” “Thus viewed from the outside, the troop is seen to be an effective way of life and one that is essential to the survival of its individual members.” ... “Field

studies show the adaptation value of these social ties. Solitary animals are far more likely to be killed, and over the generations natural selection must have favored all those factors which make learning to be social easy."

And Robert M. Yerkes concluded: "One chimpanzee is no chimpanzee".

From early childhood, the individual human being is dependent on small social groups and spends in them most of his life. And yet, the theory of small social groups is one of the youngest branches of behavioral sciences.

As it was argued elsewhere [2], people of all times—not being bothered by the theories of psychologists and not waiting until psychologists would discover it — have been using groups as natural frames of reference and intuitively regarded them as systems. And more than that. The observations of the first author have persuaded him that whenever an individual goes, even if alone, he carries with him a "group schema", which is a condensed experience from his past with different groups, assumptions what people are like and how it is best to deal with them. We can say that man "lives" in his "group schema", as is most vividly seen in dreams, daydreams and hallucinations. In these conditions, man acts in fantasy and receives fictional feedbacks from persons of his "group schema". He uses his group schema not unlike a scientist uses a model — for orientation in reality, for prediction of the behaviour of real people including himself, and as an aid to decision-making. Furthermore, he uses his "group schema" for training in interpersonal relations (what we see externalized in children's play) and for partial satisfactions, as is again best seen in dreams and fantasy. (The function last mentioned, that of partial satisfaction, is not entirely lacking in models used by scientists, but is usually overlooked and not easily admitted.)

This minimum explanation was necessary to make our trend of thought understandable. In the present conceptual framework, the dichotomy "intrapyschic processes-interpersonal processes" so common in psychological thinking (also in the thinking of psychoanalysis) disappears. The "intrapyschic processes" are understood here as models of the interpersonal processes.

3.2. Musical experience and "group schema"

Following the general pattern of psychological thinking in the past, the psychology of music was to a large extent individualistic and was concerned with individual "feelings". Now it is time, also in this field to use the new insights mentioned above.

The basic assumption of this article is that an important (if not central) part of musical experience is the participation of an individual on the processes of the composer's "group schema". Here, we do not attach much importance to the differences between the composer on one side and the interpreter and listener on the other. Certainly, there are differences in their group schemata but there are similarities also and without them, there could be no interindividual art. The composer attempts to satisfy in fantasy some of his interpersonal needs and this is signified iconically in

*Handwritten notes:*  
\* / de seful are in interista i production de rap. gesticulatiune cu toata o lista  
- unde as vrea sa scrie si sa scrie si sa scrie si sa scrie si sa scrie si sa scrie  
si sa scrie si sa scrie si sa scrie si sa scrie si sa scrie si sa scrie

the piece of art. The listener has similar needs and they can be partially satisfied in fantasy by listening to the music in question. Generality of signs is here an advantage, the only requirement being that they are distinct enough to induce processes in the "group schema" of the listener similar to those of the composer, without excluding all personal dissimilarities. It is maintained here that the group schema of the composer and its transformations are iconically represented in music, as they are in dreams or in private fantasy.

According to the present view, neither the composer nor the listener are clearly aware of the interpersonal tendencies satisfied in music. This may suffice to warn the reader not to connect what is reported here with "program" in music. Also "absolute" music signifies interpersonal processes, according to the view represented here.

### 3.3. The signs of music

As it is maintained that interpersonal processes are signified in music, the question arises in which way this can be done. Certainly, it is not by means of any verbal language. And this is perhaps why S. Freud, not taking other sorts of signs into consideration — once remarked that he did not see the possibility to apply psychoanalysis to music.

Of course, an art exists in which the interpersonal processes are manifestly signified non-verbally, and that is pantomime. In pantomime, the signs being used are expressive gestures and postures. No doubt nonverbal gestures play an important role in all human communication and the intricate laws of its use are being discovered only slowly. Recent researches show that in a human group, its members interact with their gestures in ways which they are unaware of and that this in an important means how to keep a group in equilibrium (see for example Schefflen [11]). This language of gestures and postures is to a large extent culturally determined, but as Ch. Darwin suggested it is based on instincts perhaps even in man.

Now it is believed here that musical signs can signify gestures and postures and that the interpersonal processes can be communicated in this way. The listener (and by "listener" we understand also the "composer" and the "interpreter") either accepts the interpersonal tendencies represented as his own, or he perceives them as belonging to a Generalized Other. E.g., an aggressive tendency is either accepted by him as his own, or he perceives it as emitted by the other and reacts by reciprocal tendency, either of flight (fear), counteraggression, or some other. It seems that in some instances the music itself determines whether it is one way or the other, in other instances it is left ambiguous. (According to the previous experiments of the first author, in sleep probably owing to the protective function of sleep all the active tendencies are likely to be perceived as belonging to the Other.)

Instead of analysing the ways in which sounds become vehicles of musical signs, we chose, as a first step, to design crucial experiments which would decide whether musical signs signify interpersonal tendencies at all.

The hypothesis which we endeavored to test is that *music signifies interpersonal tendencies which can be identified by independent judges with a consistency better than chance.*

Three experiments were performed. The first one, published earlier, will be mentioned only shortly.

#### 4.1. Experiment No. 1

In order to test our hypothesis, we simplified the categorizing of interpersonal tendencies by making use of Leary's list of eight main interpersonal tendencies: (1) dominance, (2) selfassertiveness, (3) aggressiveness, (4) passive aggressiveness, resistance, (5) submissiveness, (6) dependence, (7) affiliation, (8) protectiveness. These interpersonal categories are described in detail in Leary's book *Interpersonal Diagnosis*.

There were three judges who listened to 24 fragments of music of the last three centuries and assessed them independently in terms of the eight interpersonal tendencies listed. One or more tendencies were expected to be present in every fragment.

The specific hypothesis to be tested under these conditions was: *Each fragment of music signifies one or more of the eight interpersonal tendencies listed, and the three judges will be able to recognize them. Their agreement will be better than chance.*

As described in [1] detail, the null hypothesis was rejected at the 5 per cent level of confidence. *It was concluded that the interpersonal hypothesis was supported by the results of the experiment.*

#### 4.2. Experiment No. 2

The disadvantage of the experiment mentioned was the small number of judges. Therefore, the experiment was repeated with 59 independent judges and in a different cultural milieu (during a Psychotherapeutic Seminar in Lindau, Germany in 1965). The used fragments differed from those in the first Experiment. There were 17 fragments, which can be seen in Tab. 1.

As can be seen from Fig. 1—17, the high degree of agreement among the judges is evident. Nevertheless, the null hypothesis was tested for every fragment that the three judges selected one or more of the eight tendencies by chance. In that case it could be expected that the tendencies would be chosen with equal probability, i.e., that the empirical distribution would not significantly differ from the expected one (the expected one being the same frequencies for all the tendencies). The difference between the observed and expected distribution for every tendency was tested by the  $\text{Chi}^2$  test. For 7 degrees of freedom the  $\text{Chi}^2$  value corresponding to the 1 per cent



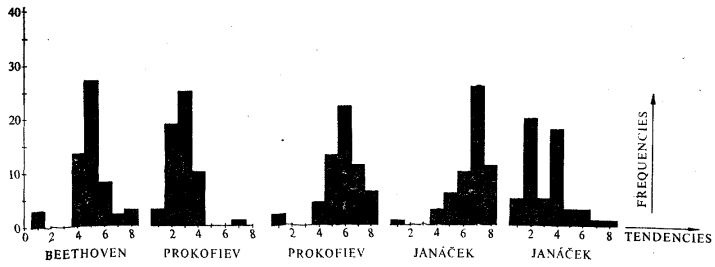
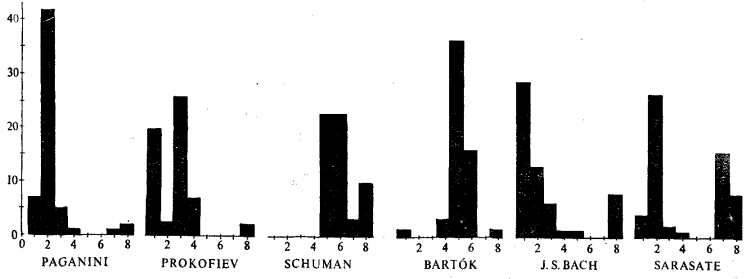
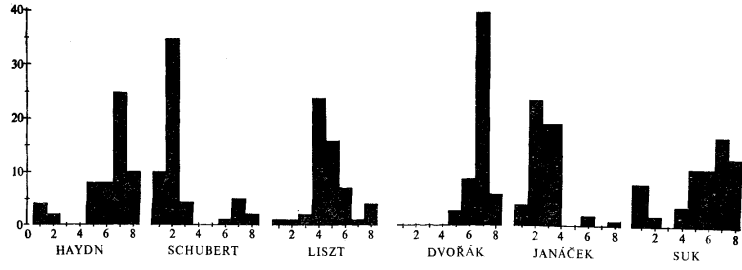


Fig. 1-17.

- 
1. J. Haydn, Symphony in G Major, op. 94, First Movement, bars 5—15
  2. F. Schubert, Symphony No. 7 in C major op. posth., 2. Movement (Andante con moto), bars 30—43
  3. F. Liszt, Torquato Tasso. Lamento e Trionfo, bars 1—11.
  4. A. Dvořák, Quartet in A Flat Major, op. 105, 4. Movement (Lento molto cantabile), bars 1—16
  5. L. Janáček, Taras Bulba, 2nd Movement (Alegro), bars 13—70
  6. J. Suk, Serenade in E Flat Major, First Movement (Andante con moto), bars 1—35
  7. N. Paganini, Concerto No. 1 in D major for Violin and Orchestra, op. 6, First Movement (Allegro meastoso), bars 96—104.
  8. S. Prokofiev, Ballet Romeo and Juliet, Second Suite (Allegro pesante), bars 17—26
  9. R. Schuman, Märchenbilder op. 113, for Piano and Viola, Fourth Part (Langsam mit melancholischem Ausdruck), bars 1—30
  10. B. Bartók, Négy szlovák népdal (Four Slovakian Songs) 1. Lakodalmas Leöhelye, bars 58—76
  11. J. S. Bach, Musical Offering, Ricercar, bars 162—185
  12. P. de Sarasate, Romanza andaluza op. 22, No. 1, for Violin and Piano, bars 1—27
  13. L. van Beethoven, Piano Sonata in A Flat Major op. 26, Second Movement (Marcia funebre sulla morte d'un Eroe — Maestoso andante), bars 1—8
  14. S. Prokofiev, Piano Concerto No 2, Third Movement (Intermezzo Allegro moderato), bars 20—39
  15. S. Prokofiev, Ballet Romeo and Juliet, Second Suite (Andante con eleganza), bars 1—52
  16. L. Janáček, Sonata for Violin and Piano No. 3, Second Movement (Balada-Con moto), bars 1—36
  17. L. Janáček, Sonata for Violin and Piano No. 3, First Movement (con moto), bars 1—38
- 

level of confidence is 18.5. The range of the Chi<sup>2</sup> values for the 17 fragments is between 41.3 (fragment No. 6) to 196.1 (fragment No. 7). *Therefore, it can be concluded that the interpersonal hypothesis is supported again*, this time as strongly as is seldom found in psychological research.

This experiment was conducted by the third (H. J.) and the first author (F. K.) and statistically evaluated by the second (J. J.) and the third (H. J.) author. (Further on the contribution of every author will be specified. The rest of the article, not indicated, is the work of the first author.)

#### 4.3. Experiment No. 3

4.31. In the third study, the same fragments as in Experiment No. 2 were used, but a different system of classification was applied. The new system, designed by the first author, is believed to be superior to that of Leary, as the interpersonal tendencies are defined by the direction in relationship to the Other. Also, some important ones which are missing in the Leary's system, like flight (fear), are included.

Basically, there are four directions in which every self-preserving system, as an organization that tends to maintain itself through change, has to move. (Here, the basic idea to take the selfpreserving activities of a system as a starting point, is taken over from Morris [9].) It has to interact with other system (direction "towards"), and, under different conditions, it has to avoid the interaction in order to preserve its own system characteristics (direction "away"). Further, it has to control, direct and manipulate the other system (direction "above"), or to let itself to be controlled, directed and manipulated (direction "below") (see Fig. 18). In the present classification, two kinds of activities for every direction are distinguished. The direction of approach, "towards", is represented by the tendencies of *affiliation* (cooperative activity) and *fight* (competitive activity). The opposite direction, "away", is represented by *avoidance* (detachment) and *flight* (fear). The direction "above" is represented by the tendencies of *dominance* and *positive Exhibition* (that is, exhibiting a supposedly positive quality of oneself, like attractiveness, status, power, etc.). The opposite direction, "below", is represented by the tendencies of *submission* and *negative exhibition* (presenting oneself as weak, suffering, unhappy, ill). As will be noticed, the opposites affiliation-avoidance, fight-flight, dominance-submission, and positive and negative exhibition have relationship to the direction of the expressive movements

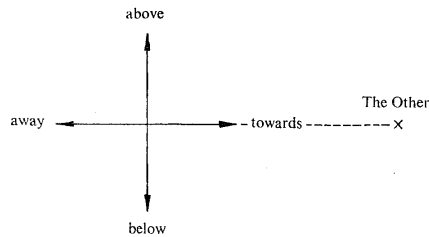


Fig. 18.

concerned, but it is not suggested that they are opposites in the sense of bipolar factors of factor analysis. As there is no generally accepted and empirically derived classification of interpersonal tendencies yet, we will take it as a convenient list, without making any unnecessary assumptions about polarities.

Fig. 19 shows the position of tendencies. They are described in the following list:

- A+ (Affiliation): seeks cooperation, closeness, friendship, love.
- A- (Avoidance, detachment): avoids contact, seeks isolation, distance.
- F+ (Fight): attacks, destroys, shows anger, aggression.
- F- (Flight): escapes from danger, is frightened, fears.
- D+ (Dominance): directs, dictates, advises, controls.
- D- (Submission): asks (or admits) direction, advice, control.
- E+ (Exhibition +): exhibits a supposedly positive quality (attractiveness, status, power, intelligence, etc.)

E- (Exhibition -): exhibits lack of some supposed quality (presenting oneself as weak, suffering, ill, miserable, unhappy, sad).

Again, it was supposed that one or more tendencies can be present in every fragment. For every fragment, three judges (the three authors F. K., J. J. and H. J.) classified independently every tendency as 0 (absent), or 1-3 (present with different degrees of intensity).

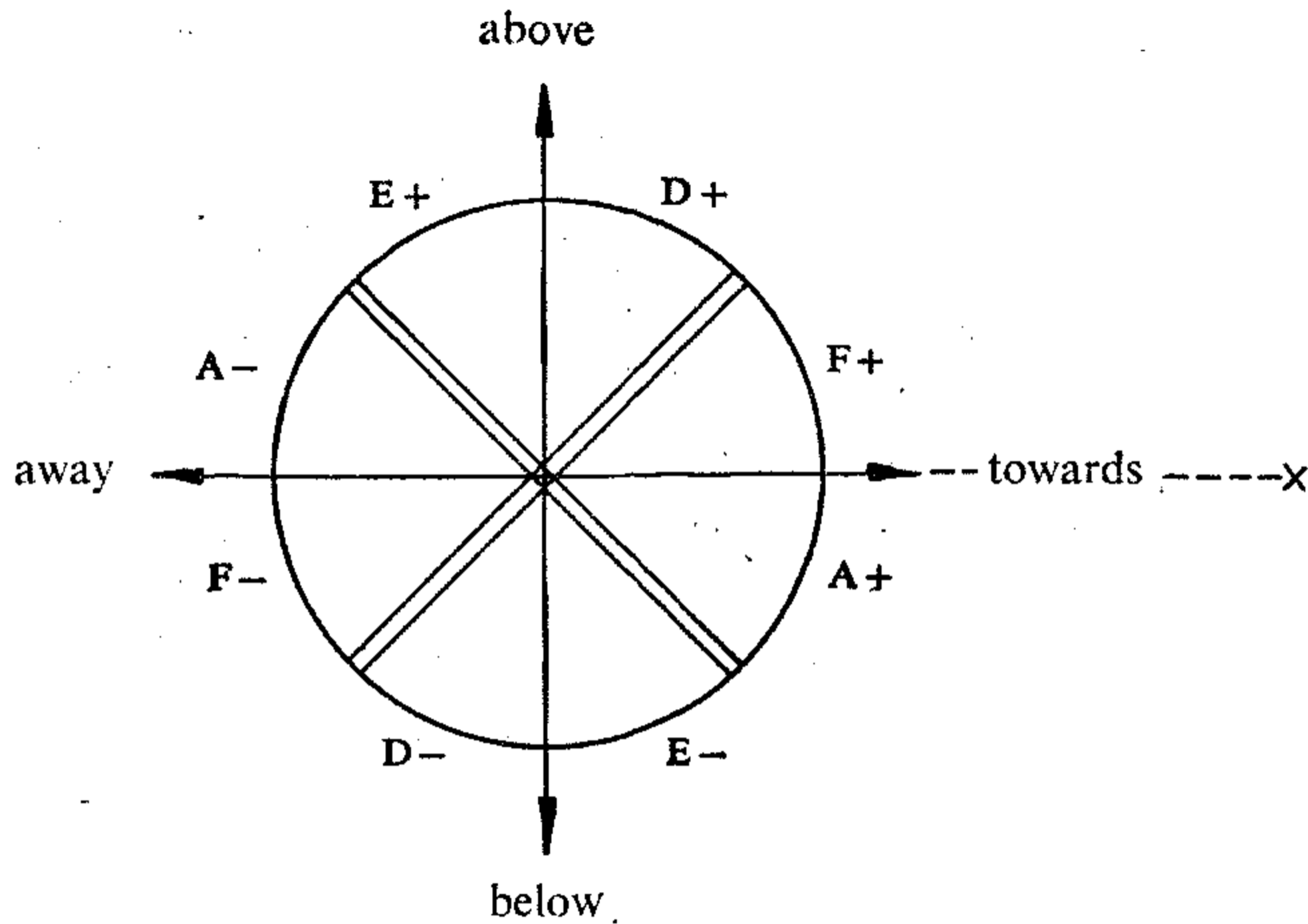


Fig. 19.

The ratings of the 17 musical fragments by the 3 judges are shown in Tab. 2. The testing of the hypothesis and the related computations are the work of the fourth author (Z. K.).

In this case the null hypothesis which has to be refused can be formulated in the following way: Maximum absolute difference in every triplet of rating values of the 3 judges for every tendency in every fragment is a chance variable, the distribution function of which is given by the assumption that every judge in every instance chooses one value of the 7-point rating scale by chance, that is, with the probability of one seventh. According to this assumption the frequencies of maximum absolute differences for all tendencies could be lumped together as is shown in Tab. 3.

The difference between the two distributions, the empirical one and the expected one, was tested by the  $\text{Chi}^2$  test. The  $\text{Chi}^2$  value corresponding to the 1 per cent level of confidence for 4 degrees of freedom is 16.8, whereas the value of  $\text{Chi}^2$  for the observed data is more than 150.

The  $\text{Chi}^2$  value is far beyond the 1 per cent level of confidence. Therefore the null hypothesis can be refused and the *hypothesis of the presence of independently identifiable tendencies in the fragments of music is supported.*

4,32. There is another way to study the data presented. The corresponding hypothesis can be formulated as follows: *If a ranking order of every judge is established for every tendency, there will be correlation among the rankings of the three judges,*

Tab. 2.

375

Fragment No.	A			F			D			E		
	F. K.	J. J.	H. J.	F. K.	J. J.	H. J.	F. K.	J. J.	H. J.	F. K.	J. J.	H. J.
1	2	2	2	0	0	0	-1	0	-2	0	1	2
2	0	-2	0	0	2	1	1	3	2	2	3	3
3	0	1	-1	0	-1	1	1	0	2	-2	-2	1
4	2	3	3	0	0	0	0	0	-1	0	0	1
5	1	1	-1	2	3	2	2	2	1	2	0	1
6	3	2	2	0	0	0	1	0	-1	1	1	1
7	1	0	0	0	1	2	1	3	1	3	3	3
8	-1	-1	0	3	3	2	2	2	2	2	2	2
9	2	3	1	0	0	0	1	1	-1	0	1	-1
10	0	-2	1	0	-1	-1	-2	-2	-2	-1	-2	-2
11	0	0	0	1	0	1	1	2	2	1	1	1
12	2	1	0	1	1	0	1	2	1	2	2	2
13	0	0	2	0	0	1	1	0	2	-1	0	1
14	0	-1	-1	2	2	2	2	1	2	2	1	2
15	2	2	2	0	0	0	-1	-1	-2	-1	1	-1
16	1	3	2	0	0	0	-1	-1	-1	-2	2	-1
17	1	-1	0	1	2	1	1	2	1	-1	-1	2

Tab. 3.

Differences of rating values	Expected frequencies	Observed frequencies
0	1-3872	12
1	7-1332	24
2	11-8932	23
3	14-2732	3
4	14-2732	1
5	11-8932	0
6	7-1332	0

although there may be differences in their dispositions to react to the tendencies in question.

The judges did not know during the experiment that their judgements would be studied from the point of view of rankings. Kendall's rank correlation coefficient was used with the help of tables computed by Zd. Mokry [6]. For the values of the 17 fragments and the 3 judges the critical value of the coefficient at the 1 per cent level of confidence is 0.573 whereas the values of the coefficients computed from the data are beyond the critical value: they are for the tendency A 0.687, for the tendency

376 F 0-622, for the tendency D 0-710, and for the tendency E 0-599. *These results support the hypothesis on the correlation of rankings of the three judges.*

This method for the treatment of data was suggested and the computation conducted by the fourth author (Z. K.).

4,33. An additional experiment was suggested by the same author (Z. K.) to see whether the three judges are biased in choosing certain numbers. Therefore they were asked, one year after the experiment was conducted, to write down numbers as if they would pass judgements about the 17 fragments using the 7-point scale, but instead to write down the numbers at random. The results show that although there are personal biases in choosing values of the variables in question, they do not explain the results of the experiment.

4,34. For reasons of completeness an unfinished study on the expressivity of music will be shortly mentioned. As explained in Chapter 2, a sign is regarded "expressive" to the degree that its production is itself taken as a sign by an interpreter of some state of its producer.

Thirteen 3-point scales were constructed describing various characteristics of the composer expressed in the fragments. They are: 1. muscular tension-relaxation, 2. movement, 3. heart rate, 4. breathing rate, 5. gastrointestinal activity, 6. sex arousal, 7. feeling of physical wellbeing, 8. stability-lability, 9. serious-humorous, 10. gay-sad, 11. happy-unhappy, 12. fearless-anxious, 13. cold-warm.

The 17 musical fragments as in 4.2 and 4.3 were used and were evaluated by the same three judges as in 4.3. The results, known so far, are promising.

## 5. DISCUSSION

The three experiments presented support strongly the hypothesis that music of different sorts signifies interindividually different interpersonal tendencies. Further, another unfinished study seems to be in favour of the hypothesis about the expressivity of music. (It is admitted that the interpretation of the expressive signs is an open problem and is regarded as a provisory one.)

The empirical findings open a way to further questions like: In which ways does music signify interpersonal tendencies and is expressive? Is the language of music "natural" or learnt like verbal languages? What are the cultural limits of understanding of music?

No doubt, only a further research both in the direction suggested here (but proceeding from the present macro-analysis to micro-analysis) and in other directions is necessary. Here, only some theoretical considerations will be introduced, which can perhaps give some clues for further research.

It can be easily shown that musical language of different countries and of different periods makes use of musical signs which are learnt and which cannot be understood without learning. L. B. Meyer [5] writes about this:

"Some connotations are entirely traditional. Association is by contiguity; i.e., some aspect of the musical materials and their organization becomes linked, by dint of repetition, to a referential image."

"Certain instruments become associated with special concepts and states of mind. The organ, for example is associated for Western listeners with the church and through this with piety and religious beliefs and attitudes. The gong is linked by contiguity to the Orient and often connotes the mysterious and exotic. Certain modes of tonal organization may awaken connotations. The pentatonic mode, for example, is used in the nineteenth century to represent things pastoral. Certain intervals may be used to indicate special concepts or states of mind. For instance, the diminished fifth was closely associated with expressions of grief and anguish during the baroque period. Or specific tunes may be employed to evoke concepts, memories, or image processes. This is a frequent device of Charles Ovez."

"As a rule such associations are used in combination so that each reinforces the other. If the composer wishes to evoke connotations of piety and those connected with religious beliefs, he will not only employ the appropriate instrument but he will also use techniques of composition-modality, polyphony, and so forth-that have the same association."

"Notice that all these associations are intracultural. The gong will have not a special exotic meaning for the oriental in whose music it is common, though it may have other associations for him. Nor will the pentatonic mode connote things pastoral to peoples who use this mode for all kinds of music, for cultivated art as well as for folk music."

Certainly, one has to be extremely cautious before claiming certain signs as general and "natural". Again, as Meyer says:

"In the West, for example, death is usually depicted by slow tempi and slow ranges, while in certain African tribes it is portrayed in frenzied musical activity; yet this results from difference in attitudes towards death rather than from differences in the associative processes of the human mind."

This example shows that neither quick acceptance of generality nor quick rejection would be appropriate.

Although this is undoubtedly true, there seem to be cogent reasons for a hypothesis that there is a natural basis of musical languages of all cultures and times. Some would like to discuss this in terms of physiology of sound perception and its connection with the autonomic and motor reactions. This will certainly be a promising way one day, but not enough is known so far. Instead of that, attention will be paid here to expressive movements as supposed basis of musical language. It has to be admitted, however, that also here we are not walking on a very firm ground.

It was Ch. Darwin who studied the expressive movements of man in relationship with instincts. Unfortunately, the concept of instincts is very unstable in psychology: Instincts are accepted as explanation of all behavior in one generation and in the next rejected completely. In the last decades, there was revival of interest in instincts,

that is, in behavior which is inherited and unlearned. The interest was created especially through the work of ethologists, but during the last years, there have been differences of opinion about instincts even among ethologists themselves.

According to Konrad Lorenz [4], all instinctive processes in animals which are not fully activated, nonetheless manifest themselves in rudimentary form in behavior (so called "intentional movements", "Intentionsbewegungen", Heinroth). These movements, if understood by an observer, can inform him what goes on in the organism in question. If the observer is an animal of the same species and reacts in an appropriate way, this may be of a new survival value for the species. Through the process of natural selection rudimentary forms of instinctive behavior through modification, elaboration and "ritualization" became innate "social releasers" of paramount importance for the individual and species. It is of advantage that an animal reacts in different situations in appropriate ways, without complicated learning, to significant members of its own species, like parent, child, sexual object, rival, etc. "Social releasers" are composed of simple "sign stimuli" — visual, acoustic etc. — and the reaction to a social releaser is a sum of reactions to various sign stimuli (law of heterogenous summation, according to Tinbergen). That means that isolated sign stimuli do release partial reactions which would be the complex social releaser release. This is strikingly different to reactions acquired by learning to complex stimuli. There the isolated partial stimuli may not release any reaction at all.

W. Smid, studying the releasing capacity of the typical human expressive activity, laughter, found that it is composed also of small number of sign stimuli. "This fact" says Lorenz, "beside many others, supports strongly the contention that the reactions of man to the expressive movements of his fellow men are to a large extent caused by the innate releasing mechanisms" [4]. According to Lorenz, "the innate releasing mechanisms are the "rigid structural" elements of human society."

As the elements which compose the innate releasing mechanisms are relatively simple, they can be imitated. In fact, the experiments with dummies became an important part of the methodology of the present-day ethology. Also man is ready to react partially to dummies, imitating social releasers. Lorenz describes how people cannot help misinterpreting certain characteristics of animals, in terms of innate releasing mechanisms. Bizzare forms of clouds or rocks can be anxiety producing, if they remind one of aggressive attitude of another man. This is, according to Lorenz, the correct explanation of the "physiognomic perception of objects."

Now according to the present hypothesis, *musical signs have either the capacity to induce in the subject rudimentary expressive gestures and postures, or to act as partial social releasers, provoking him to partial reciprocal reactions.*

That is, the subject either *identifies* (through the process of imitation, empathy) with the tendency of the music, takes it as his own, or he perceives it as coming from somebody else, and this releases in him a *reciprocal* social reaction. These both kinds of reactions are partly learnt, but partly are — according to the present hypothesis — "natural", based on the physiological endowment of man and his innate



mechanisms. By introducing Self and Others, music has the means to signify social interactions.

For every of the eight interpersonal categories and some of their combinations, examples of fixed expressive movements and attitudes in animals can be found. According to Darwin and some of his followers among ethologists (Lorenz), they exist in man also.

It may be of interest that some students of aesthetics, concerned mainly with paintings and sculptures, stressed inner imitation (empathy, identification) since 1890. According to Listowel (quoted from [10]), for Karl Gross, a German psychologist, who published his main works in 1899 and 1902, aesthetic enjoyment was the product of a sympathetic sharing in the life and emotions of others, greatly facilitated by the kinesthetic activity of inner imitation by real or incipient movements of the legs, the arms, the whole trunk, or the voluntary muscles of the face. And Lipps in his "Raumästhetik" (1893–97) says (quoted from [10]):

"The column seems to gird itself up (sich zusammen zu fassen) and erect itself, that is to say, to proceed in the way in which I do when I gird myself up and erect myself, or remain thus tense and erect in opposition to the natural inertness of my body. It is impossible for me to be aware of the (shape of the) column without this activity seeming to exist in the shape I am thus aware of."

According to Listowel, Lipps applied his principle to individual forms in art and nature, to rhythm in poetry and music, to colours, tones, and words, and to the more outstanding aesthetic categories. G. Robinson, a contemporary author [10], expresses similar views which can be summarized in a following way: In aesthetic visual experience, the central role is played by empathy. The observer imitates unconsciously the object by activating unconsciously tactile – kinesthetic sensations and performs rudimentary movements. The artist captures the perceiver's attention, he compells him to engage in perceptual activities with reference to the elements of design, but he inhibits his tendency of verbalizing (that is, naming and describing the object) and by so, frustrating him he leads his perception to regress to archaic tactil-kinesthetic layers. As a whole, he keeps and directs his attention, not unlikely a hypnotist does with his hypnotic subject.

This sounds plausible, but is probably only half of the truth. It is suggested here that also paintings and sculptures, beside inducing the identification process, function as "dummies" of social releasers, and activate reciprocal reactions. E.g., to mention only the most obvious, the form of female body is - according to K. Lorenz - a visual innate social releaser for human male; apparently, it is used as such to induce a "physiognomic perception" in arts, however geometrically simplified. Incidentally, S. Freud's and C. G. Jung's visual symbols receive thus perhaps some support from ethology: it may be speculated that the dreamer, if sexually aroused, constructs social releasers in fantasy appropriate for him.

It may be mentioned in passing that some preliminary experiments of two of the authors (F. K. and J. H.) seem to indicate that there is some agreement among judges

if paintings are used instead of pieces of music. (In a similar way, Morris [8] used categories of values in studying agreement of judges about paintings.)

At the end, it must be stressed again, that in this article, the same as in the previous one, the interpersonal analysis of music was not used as a criterion of aesthetic value. At the crude level of analysis indicated so far, there is no difference between "bad" music and "good" music. However, it is hoped that the interactional analysis of music may contribute to the concept of aesthetic quality in the future. It seems that the light popular music reflects conventional and stereotypic relationships among people, and releases corresponding interpersonal tendencies in the listener, but without any further effect. On the other hand, it seems that music as art offers new insights about oneself and about one's interpersonal relationships, and activates one to seek creatively new attitudes and solutions in life. Apparently, the language of music is rich enough, and there even seems to be a meta-language in which the signs of music can be qualified.

(Received December 20th, 1967.)

#### REFERENCES

- [1] F. Knobloch, M. Poštolka, J. Srnc: Musical experience as interpersonal process. *Psychiatry: Journal for the study of interpersonal processes (U.S.A.)* 27 (1964), 4, 259—265.
- [2] J. Knoblochová, F. Knobloch: Family psychotherapy. In: *Mental health paper No 28*, World Health Organization, Geneva 1965.
- [3] S. K. Langer: *Philosophy in a new key*. Mentor book, The new American library, 1942.
- [4] K. Lorenz: *Über tierisches und menschliches Verhalten*. Band I, II. Piper Verlag, München 1965, 1966.
- [5] L. B. Meyer: *Emotion and Meaning in Music*. Phoenix Books, The University of Chicago Press, 1956.
- [6] Mokřý Z.: Tabulky pro hodnocení shody několika pořadí. *Aplikace matematiky* 7 (1962), 149—160.
- [7] Ch. Morris: *Signs, language and Behavior*. Prentice Hall, New York 1946.
- [8] Ch. Morris: *Varieties of Human Values*. The University of Chicago Press, 1956.
- [9] Ch. Morris: *Signification and Significance*. The M.I.T. Press, Cambridge, Massachusetts 1964.
- [10] G. Robinson: A new theory of empathy and its relation to identification. *Journal of Asthma Research (U.S.A.)* 1 (1963), 1, 49—114.
- [11] A. E. Schefflen: Quasi-courtship Behavior in Psychotherapy. *Psychiatry: Journal for the study of interpersonal processes (U.S.A.)*, 28 (1965), 3, 245—257.
- [12] S. L. Washburn, J. De Vore: The social life of baboons. In: *Primate social behaviour*. (Ed. Ch. H. Southwick). D. van Nostrand, Princeton 1963.
- [13] R. H. Waters, D. A. Rethlingshafer, W. E. Caldwell: *Principles of Comparative Psychology*. McGraw Hill, New York, 1960.

## Interpersonální hypotéza v semiotice hudby

FERDINAND KNOBLOCH, JAROMÍR JUNA, HANA JUNOVÁ, ZDENĚK KOUTSKÝ

Vlekoucí se rozpory o tom, zda hudba obsahuje významy, tj. zda je prostředkem značkové komunikace nebo dokonce neverbální řeči, jsou zatíženy četnými pseudo-problémy, jak ukazuje dosavadní semiotický rozbor. Pokračovat v něm v celé šíři není úkolem této práce, nýbrž jen potud, pokud je to třeba k formulaci nové interpersonální hypotézy hudby a jejího testování.

V soulase s individualistickým a introspekcionistickým zaměřením starší psychologie byla zpravidla kladena otázka, jaké „city“ hudba vyjadřuje. Naproti tomu podle interpersonální hypotézy hudby, rozvíjené v této práci, hudba ikonicky signifikuje interpersonální tendence subjektu a jím představovaného „generalizovaného druhého“. Interpret a posluchač se podílí na řešení interpersonálních problémů skladatele, aniž je třeba, aby u někoho z nich tyto procesy byly plně vědomé.

V provedených experimentech posuzovali soudci nezávisle přítomnost interpersonálních tendencí v úryvcích evropské hudby z posledních tří století. Ke klasifikaci interpersonálních tendencí bylo nejprve užito schéma Szucka a Learyho, později Knoblochovo schéma interpersonální a schéma expresivity. Jde o tyto experimenty: 1. V prvním experimentu, uveřejněném dříve [1], byla srovnána klasifikace tří soudců posuzujících 24 fragmenty. Výsledek byl významný na 5% hladině spolehlivosti. 2. V druhém experimentu byla porovnána klasifikace 59 soudců posuzujících 17 fragmentů, odlišných od prvního experimentu. Výsledek je signifikantní na 1% hladině spolehlivosti. 3. Tytéž úryvky jako v experimentu 2 byly hodnoceny třemi soudci s použitím nového interpersonálního schématu. Jak shoda v klasifikaci soudců, tak korelace jejich pořadí je signifikantní na 1% úrovni spolehlivosti. Pokus s libovolnou volbou čísel týmiž soudci ukázal, že výsledky nemohou být vysvětleny osobním sklonem ve volbě určitých čísel. 4. Bylo užito nově konstruovaného schématu o expresivitě hudby. (Příčemž dle Morisse je značka expresivní v míře, v jaké je pro interpreta značkou stavu producenta.) O experimentu bude referováno jinde.

Kladné výsledky uvedených experimentů jsou východiskem konceptuálního rámce, spjatého s teorií osobnosti a malé společenské skupiny. Z experimentů lze usuzovat, že jsou dva základní vztahy subjektu k interpersonální tendenci v hudbě. Subjekt může jednak tendenci obsaženou v hudbě přijímat za svou (identifikaci), jednak ji přijímá jako produkovanou druhou osobou a zaujímá k ní komplementární postoj (např. submisivní – dominantní). Má-li hudba tyto dvě kategorie, může signifikovat sociální interakci (při čemž signifikace může být nejen designativní, nýbrž též deskriptivní a evaluativní).

Do budoucna se nabízí zkoumat navrženou metodikou podíl kulturního a vzroze-  
ného na hudební semióze. Ačkoliv lze prokázat, že četné hudební významy jsou  
kulturně osvojené, není vyloučena domněnka, že některé mají přirozený biologický  
základ. S odvoláním na práce etologů, zejména K. Lorenze, se uvažuje o přirozených  
složkách hudby jako o „atrapách“ částí sociálních spouštěčů podle Tinbergena.

*Doc. MUDr. Ferdinand Knobloch, CSc., Fakultní poliklinika, Karlovo nám. 32, Praha 2;*

*RNDr. Jaromír Juna, CSc., Ústav jaderného výzkumu ČSAV, Řež u Prahy;*

*PhDr. Hana Junová, Fakultní poliklinika, Karlovo nám. 32, Praha 2;*

*RNDr. Zdeněk Koutský, CSc., Ústav teorie informace a automatizace ČSAV, Vršovická 49,  
Praha 2.*