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# REMARKS ON THE CONCEPT OF ICONIC SIGN

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1

In her work *Pojęcia znaku* [*The concept of sign*] Janina Kotarbińska presents the following definition of iconic sign: "Object $A$ is an iconic sign of object $B$ on the basis of convention $K$ if and only if object $A$ possesses such feature $F$ and is similar to object $B$ on such account $W$ that (1) due to the similarity, the fact that object $A$ possesses feature $F$ is an indicate of that object $B$ possesses feature $F$; (2) on the basis of convention $K$, objects which possess the feature $F$ are eligible to express thoughts about objects similar to them on account of $W$" (Kotarbińska 1957: 120-121).

The above quoted definition may be regarded as quite representative on account of the fact that its definiens includes a condition demanding that there is an analogy between a given particular iconic sign and the object to which it refers. In the quoted paper, this requirement is a necessary condition for the object to be an iconic sign. It is worth adding that in many other cases it is even a sufficient condition.

The aim of the present considerations is to show that (1) the similarity between a particular iconic sign and the object to which it refers (a relevant similarity, that is sharing those features on account of which a particular iconic sign supposedly refers to a particular object) is not a necessary condition for accepting the particular object to be an iconic sign, (2) what is necessary is a specific similarity between the reference of a particular iconic sign and a certain object which is not identical with a particular sign, although the pertinent sign is to some extent related to the object.

2

In order to continue further considerations, it is necessary to explicate the concept of analogy. I would like to relate this concept to a two-element relation of a parametric nature, that is — the relation shall occur between objects $A$ and $B$ on account of a third factor $C$ represented by the so called parametric variable. Further, I assume that the domain as well as the codomain of the relation are specific relational systems which I shall call structures in the course of this paper.

We[1] shall say that two relational systems $S_1 = <U^1; R_1^1, \ldots, R_n^1>$ and $S_2 = <U_1^2; R_1^2, \ldots, R_n^2>$ are ANALOGOUS — on account of TERTIUM COMPARATIONIS in the form of system $S_3 = <U^3; R_1^3, \ldots, R_n^3>$ if and only if $U^1 \subset U^3$ and $U^2 \subset U^3$ and $R_1^1 \subset R_1^3$ and $R_1^2 \subset R_1^3$ and ... and $R_n^1 \subset R_n^3$ and $R_n^2 \subset R_n^3$.

The concept of analogy specified in this way is extremely general; it can refer to two individual objects, and also to two relations in the broad sense of the word — that is when properties are understood as one-element relations. A single relation can be understood as a structure whose universe is the field of the relation, however an individual object can be treated as a set whose only element is the above mentioned object. It seems needless to say that the relation, and in particular the feature (a one-element relation) here are understood extensionally (as a set of ordered n-tuples, and in particular, sets of individual objects).

Because in my opinion iconic signs are always structures whose universes are sets of elementary states of affairs, that is states of affairs of the type: the fact that object $a$ possesses feature $W$, the fact that there is relation $R$ between $a$ and $b$, etc. — the analogy between an iconic sign and its reference I shall understand further as an analogy between so understood structures. Also, I would like to emphasize that I shall call the structure which is the object reference of an iconic sign — the represented structure (i.e. represented by a given iconic sign).

Assuming that a particular iconic sign, and also its references, are structures composed of certain elementary states of affairs is by no means an arbitrary decision. Although the term "object" refers as a rule to concrete iconic signs, and is also applied to the references of these signs, it is possible to show that the so called objects in fact are always specific structures composed of elementary states of affairs. Thus, an object for example in the form of a certain fragment of the painting *Winter* by Bruegel is a structure composed of elementary states of affairs such as: $\langle\subset, \{\langle$*this portion of black*

[1]Kmita, Ławniczak 1970 p. 75

*paint which has an ellipsoidal shape*, *this portion of white and black paint which has a lengthened, branched shape*⟩}, relation of being on⟩ and also the object which refers to this structure is a structure composed of elementary states of affairs such as: ⟨⊂ , {⟨*this silhouette of a black crow*, *this silhouette of a tree branch*⟩}, relation of being on⟩.

3

Semantics differentiates conventionally between the sign-type and the concrete sign (”type” — ”token,” or in C. S. Peirce’s terminology ”legisign” — ”sinsign”). This differentiation seems to be undoubtful to such an extent that various handbooks and dictionaries of philosophical, logical or semiotic terms adopt and cite it. Thus, for example *The Dictionary of Philosophy* by D. D. Runes reads: ”The words *token* and *type* are used to distinguish between two senses of the word *word*. Individual marks, more or less resembling each other (as ”cat” resembles ”cat” and ”CAT”) may (1) be said to be ”the same word” or (2) so many ”different words.” The apparent contradiction thereby involved is removed by speaking of the individual marks as tokens, in contrast with the one type of which they are instances.(...) The terminology can easily be extended to apply to any kind of symbol, e.g. as in speaking of token- and type-sentences” (Runes 1942: 324).

Similarly, C. W. Morris writes that Peirce differentiates between what he calls ”sign” and ”legisign:” ”a sinsign is a particular something functioning as a sign, while a legisign is a ”law” functionign as a sign. A particular series of marks at a specific place such as ’house,’ is a sinsign; such a specific set of marks is not, however, the English word *house*, for this word is ”one,” while its instances or replicas are numerous as the various employments of the word. It is a law or habit of usage, a ”universal” as over against its particular instances” (Morris 1947: 48).

Although at first sight there is no direct relationship between the issue of the validity of the Peircean differentiation and the matter of the method of defining iconic signs, a critical analysis of assumptions which are the foundation of this differentiation — as I shall attempt to show — to a great degree applies also to the generally accepted way of defining the concept of iconic sign which was presented in the introduction.

Let’s raise the question then if the specific similarity between written words (the so called shape equivalence) or between uttered words (the so called sound equivalence) can indeed be understood as an equivalence relation whose abstraction classes — the so called type-signs — can be understood as adequate equivalents of what is called a sentence, a word, a

morpheme, a phoneme of a given language? In other words — what is meant is whether a similarity (understood in a specified way) between two concrete written words or between two concrete sounds is a sufficient and at the same time necessary condition to regard them as two concrete exemplars of the same sentence, word, morpheme or letter or phoneme? This question will be most conveniently considered on the basis of sounds which exemplify the same phoneme. The research in acoustic phonetics conducted by Liberman, Delattre, Cooper, or Schatz have proved, among other things, that the exact similarity between sounds which have the same acoustic features is not sufficient to regard these sounds as phonetic representations of the same phoneme; at least in some contexts sounds which represent various phonemes, namely *p*, *t*, *k* possess the same acoustic characteristics. The identity of acoustic features then is not sufficient to regard these sounds as phonetic equivalents of the same phoneme. What also follows from this is that the same phoneme can be represented phonetically by two sounds which are different in terms of acoustics; for example, the phoneme *t* has a different phonetic representation in such contexts as *writer*, and a different phonetic representation in contexts such as e.g. *toke*. Thus in general, the identity of acoustic features is neither a sufficient nor necessary condition for two concrete sounds to represent the same phoneme. If we apply additional restrictions on the condition of acoustic similarity, then perhaps we will arrive at a sufficient condition of representing the same phoneme by two sounds, however, it will definitely not be the necessary condition. If we weaken the condition of identity of acoustic features, then perhaps we will arrive at similarity which constitutes the necessary condition, however it will surely not be the sufficient condition.

By analogy — it is possible to show that no specific similarity between sounds or series of sounds constitutes the sufficient and at the same time necessary condition for two concrete sounds or series of sounds, respectively similar to each other, to represent the same morpheme, the same word, the same sentence of a given language.

## 4

Thus it is not possible to define the concept of phoneme, morpheme, word, or a sentence of a given language by means of sound equivalence relation understood one way or another. It is obvious that the same — *mutatis mutandis* — arguments support the claim that it is impossible to define the mentioned concepts as denoting classes of written words. It seems

however that the pertinent concepts can be adequately dealt with as — respectively — ideal types of written words or series of sounds.

The concept of ideal type was introduced by Jerzy Kmita in his *Wykłady z logiki* (*Lectures on logic*) in the following way: Let there be a certain set $X$ and relation $R$ which is a partial order in set $X$ (Kmita 1970: 132). Using relation $R$ as a definiens, it is possible to characterize the following relation $S$:

$$xSy \equiv \sim xRy \wedge \sim yRx$$

So defined relation $S$ is an equivalence relation in set $X$ if only it is transitive in this set. In such a case, relation $S$ divides set $X$ into subsets whose family can be called the systematization of set $X$. Elements of the systematization are ordered by the relation of being earlier in the following way:

$$X_i \text{ is earlier than } X_j \equiv \bigwedge_{x \in X_i} \bigwedge_{y \in X_j} (xRy)$$

When the systematization is a finite family of subsets of set $X$, and also in a few other cases, it is possible to distinguish the earliest and latest element of this systematization. Both of them can be called extreme elements.

Now, let there be a given law which belongs to the specific system of empirical knowledge $W$ of the most general shape:

$$\bigwedge_{x,y,\ldots} [f(x, y, \ldots) \rightarrow g(x, y, \ldots)]$$

This law is an idealization law on the grounds of knowledge $W$ if: (1) the predicate "$f(x,\ y,\ \ldots)$" denotes an extreme element of a certain systematization, (2) what follows from knowledge $W$ is the sentence:

$$\sim \bigvee_{x,y,\ldots} [f(x, y, \ldots)]$$

Thus, according to (2) the denotation of the predicate $f(x,\ y,\ \ldots)$ is empty on the grounds of knowledge $W$.

What can illustrate the idealization law is Galileo's well-known law of free fall, that is the sentence of the type:

$\bigwedge_{x}$ (if $x$ falls freely, then the distance $x$ falls = force of Earth's gravity exerted on $x$, multiplied by the square of the time of $x$'s falling, divided by 2).

The existence of freely falling objects, that is such on which only the force of Earth's gravity is exerted, is eliminated even by mere theorems of classical mechanics (condition (2) of the definition of idealization law), and at the same time a set of objects of this type is an extreme element of the systematization of the set of physical objects (condition (1) of the definition of idealization law).

What relates to the idealization law is the concept of: (1) ideal type, (2) idealization. The ideal type is the denotation of the predicate which is the antecedent of the idealization law, while the idealization is asserting this predicate about a random concrete object or about an ordered $n$-tuple of such objects. Obviously, both concepts are relativized, so is the idealization law, to a specific system of empirical knowledge $W$. Thus, the object which falls freely is an ideal type on the grounds of classical mechanics, whereas defining a concrete physical object as a freely falling object is an idealization — also on the grounds of classical mechanics.

It seems that the presented concepts of ideal type and idealization should be expanded by considering rules of cultural interpretation. For these rules, which assign particular senses to particular human activities or their products in a homogeneous way within a given cultural group (Kmita, Nowak 1968), refer not to concrete activities or products of these activities, but precisely to their ideal types, however I shall call the pertinent ideal types relativized to rules of cultural interpretation — in order to distinguish them from ideal types related to idealization laws — cultural ideal types. At the same time, on recognizing in a given concrete activity or its product, a specific cultural ideal type, I shall call it the cultural idealization. I set the cultural ideal type and the cultural idealization against the ideal type of cognitive nature and cognitive idealization, linking the two latter concepts with idealization laws.

The concept of ideal type of cultural nature can be characterized in greater detail as follows: it is the denotation of the expression "activity $C$" or "product $W$ of activity $C$" which occurs in a certain rule of cultural interpretation, thus in an utterance which can be phrased as follows: "In order to realize sense $S$, one needs to do activity $C$" or "In order to realize sense $S$, one needs to do activity $C$ which results in product $W$." Activities or products which are mentioned in rules of cultural interpretation are always extreme elements of certain systematizations, elements which are known — on the grounds of appropriate knowledge — to be empty sets. Exactly this fact entitles us to call these elements — ideal types, and to call acts of recognizing (in a given particular activity or product) an activity or product

mentioned in rules of cultural interpretation — a cultural idealization.

Thus, due to the fact that in a cultural group of users of the English language, there is e.g. the rule of cultural interpretation: "In order to communicate the state of affairs: the fact that it is raining — it is necessary to utter the sequence of words *it is raining*;" the activity mentioned in this rule, which, by the way, is determined by rules of creating words out of specific phonemes, is an ideal type, similarly to this activity's product which is postulated by our rule. On the other hand, concrete activities or products of these types of activities are CONCRETIZATIONS of pertinent ideal types.[2] By recognizing appropriate cultural ideal types in concretizations, we make the act of cultural idealization.

Regarding sentences, words, morphemes, phonemes of a given language as ideal types of concrete written words or sounds or sequences of sounds, thus treating these written words or series of sounds as concretizations of pertinent ideal types, we avoid the difficulties which are caused by attempts of defining the mentioned linguistic units as types, i.e. classes of abstraction of the relation of equivalence or shape equivalence. The source of all these difficulties is the fact that two concrete exemplars of the same linguistic unit can be sometimes less similar to each other — on account of acoustics or graphics, respectively — than two concrete exemplars of different linguistic units. By regarding two concrete exemplars of the same linguistic unit as two different concretizations of the same ideal type, which concretizations belong to different elements of the same systematization, while the elements are in "different distances" from the extreme element, we can explain the fact that acoustically or graphically different objects correspond however to the same linguistic unit. Yet, on the other hand, the fact that a greater similarity (acoustic or graphic) occurs between two concretizations of different linguistic units than between two concretizations of the same linguistic units, can be explained by this that two different systematization series which have different ideal types as extreme elements, can — to put it metaphorically — intersect, thus can possess a certain common systematization element. If this common systematization element is e.g. $X_i$, then certain elements of this class will concretize ideal type $T$, while others — $T'$; obviously there is a greater similarity (acoustic or graphic) between elements of class $X_i$, which concretize different linguistic units, than between concretizations — say — of ideal type $T$, which belong to element $X_j (X_i \neq X_j)$ and concretizations of this ideal type which belong to element $X_i$.

[2]The concept of concretization, however, in a slightly different sense, is used by Leszek Nowak in his work on methodological issues of Karl Marx's "Capital" (1971).

This type of approach to linguistic units as ideal types immediately raises a question about empirical criteria on the basis of which it is possible to know if a given particular expression concretizes ideal type *T* or rather *T'*. This question corresponds to a very complicated problem which I shall not consider here. Perhaps it is worth mentioning, however, that criteria of this type need to be structural in nature, that is they would need to make the recognition of a specific ideal type in a given particular expression dependent on prior recognition (in a hypothetical mode) of the nature of context in which the given linguistic unit would need to occur.

## 5

Let's turn again to the issue of the definition of the concept of iconic sign considered in the introduction. Contrary to the definition of type-signs of a given language there is no claim that the relation of similarity is a sufficient and at the same time necessary condition for an element of the domain of this relation to be regarded as an iconic sign of an appropriate element of the codomain. The similarity between states of affairs is understood here only as a necessary condition for one of them to be able to function as an iconic sign of the other (in some other approaches this issue looks different). What the author of *The concept of sign* most probably meant was not any similarity, thus — of any *tertium comparationis* (for such a similarity occurs between any two structures with the same number of relations which occur in their characteristics). It seems that what is meant is a similarity which we would call relevant, and which is perceived by the addressee who establishes reference of a concrete iconic sign.

Let's consider now if — following the approach applied in the case of the analysis of the definition of expression-type — it would be possible to show that no relevant analogy in the above presented sense can be the necessary condition for a given concrete structure to be an iconic sign of a different appropriate structure.

Let a certain fragment of theatrical decoration *A* represent (be a concrete iconic sign) — on account of a set of features which in Heinrich Wölfflin's terminology are called painterly (Wölfflin 1962: 51f) — a tree *B*; *A* is namely a structure whose universe and particular relations are included — respectively — in the universe and the relations of a certain more general structure, which encompasses all possible cases of occurrence of objects in the shape of a leaved tree — and only these cases. This more capacious structure plays the role of *tertium comparationis*. In particular it encompasses a set of

color stains which are decoration *A*, which represents a tree in a "painterly" (according to Wölfflin's terminology) way.

Let, in turn, fragment *A'* of a certain different theatrical decoration to the same play represent (be a concrete iconic sign) — on account of a set of features which in Wölfflin's terminology are called linear (Wölfflin 1962: 51f) — the same tree *B*; *A'* is a structure whose universe and particular relations are included — respectively — in the universe and the relations of a certain more general structure, which encompasses all possible cases of objects in the shape of a tree with a regular silhouette which is homogeneous in color and subordinates the arrangement of foliage — and only these cases. This more capacious structure plays the role of *tertium comparationis*. A particular case of such a form is exactly the decoration *A'* flatly cut in appropriate material (the silhouette), which is to represent a tree in a linear (according to Wölfflin's terminology) way.

It is easily noticeable that both structures which are *tertia comparationis* — respectively for structure *A* and *A'* are different from each other; thus, it follows that *I* — the intersection of features which are the basis for the analogy between structure *A* and the tree *B* iconically represented by it, and *I'* — the intersection of features which are the basis for the analogy between structure *A'* and the tree *B* iconically represented by it — are mutually exclusive. However, none of these complex features (intersection of features) is an analogy relevant for establishing the reference of structure *A* and *A'*; because they are too general. For feature *I* can be — on the other hand — regarded as a sum of features, from which every feature corresponds to a special case of "painterly" which has a specific position in the systematization series — from the position which borders with "linearity" to the position which constitutes ideal "painterly" (which results from the fact that the concept of "painterly" is a typological concept). Similarly, feature *I'*, which is a sum of features, from which every feature corresponds to a special case of "linearity" which has a specific position in the systematization series — from the position which borders with "painterly" to the position which constitutes ideal "painterly." What constitutes the relevant analogy are exactly these special cases of "painterly" or — respectively — "linearity." However, hence these relevant analogies are mutually replaceable in their function to assign a concrete structure with its iconic reference, hence none of them is in this respect necessary.

## 6

I have indicated in the introduction that analogy can be regarded as the

necessary condition of iconicity, however what was meant was not the analogy between a concrete iconic sign and its reference, but between this reference and the object related in a certain way with the pertinent concrete iconic sign. Namely, I believe that, as the distinction between a concrete expression and an expression-unit of a given language is possible only when the latter is understood as an ideal type, and the former — as a concretization of the ideal type, likewise maintaining the principle of analogy as a necessary condition of iconicity is possible only when the iconic sign is understood as an ideal type, while the concrete iconic sign — as its concretization: the analogy would occur between the iconic sign as an ideal type and its object reference, and not between this object reference and the concretization of the iconic sign.

In order to avoid potential terminological misunderstandings, I would like to emphasize that what I have so far called a concrete iconic sign, I shall now call — a concretization of the iconic sign, while the term ”iconic sign” shall be restricted to an appropriate ideal type.

Assuming that the iconic sign is always a certain ideal type, may only seemingly seem contrary to common intuitions; in fact it would be easy to reach consensus — e.g. among addressees of paintings — that when they understand a given concrete painting as representing a specific person, landscape or genre scene, etc., they ignore a whole series of features, which are inherent to the surface of the painting, while, on the other hand, introduce to the painting certain features which in fact are not inherent to it, because they follow their hypothetical knowledge of what the painting should represent.

Most importantly is, however, that by regarding the iconic sign as an ideal type, we maintain the principle of analogy as a necessary condition of sign's iconicity as valid, although particular concretizations of the same iconic sign can be radically different from each other. Admittedly, these differences enable raising the troublesome question why so different objects are to represent iconically the same thing, however we can answer this question — and maintain the principle of analogy as the principle of iconic representation — that the different objects are different concretizations of the same iconic sign and on this account represent iconically what the sign represents, thus — the same state of affairs. The mere fact that two concretizations of the same iconic sign can differ from each other more than two concretizations of various iconic signs, may be — generally — explained in the same way as in the case of concretizations of linguistic expressions. In particular, the above example of different theatrical decorations may be characterized as follows: theatrical decoration $A$ and theatrical decoration

*A'* are different concretizations of the same iconic sign which represents a specific tree (which is fictitious — because it belongs to the represented reality of the theatrical play). It is an ideal type which can be expressed as a set-theoretic sum of extreme elements of the same systematization series; we are dealing here with a systematization series whose particular elements correspond to Wölfflin's "painterly" to a greater and greater degree, and increasingly approach the case of ideal "painterly," while, at the same time, moving away from the case of ideal "linearity." Obviously, this series can also be characterized by adopting as a starting point the reverse of the relation of approaching the ideal "painterly," thus — approaching the ideal "linearity." The set-theoretic sum of both extreme elements of this systematization series represents exactly the iconic sign which is of interest here. According to what has been stated previously with reference to ideal types, this sum — on the grounds of knowledge about art — is an empty set. It is an empty set because there is no piece of art which is ideally "painterly," or ideally "linear."

Let's notice that the iconic sign — ideal type which is of interest here should not be confused on account of its logical construction with ideal type called in chemistry — a perfect gas. Namely, a perfect gas is not a set-theoretic sum, but an intersection of extreme elements of the two following systematization series: the systematization series whose elements are classes of "portions" of gas which have gradually decreasing volumes of particles, and the systematization series whose elements are classes of "portions" of gas which have gradually declining forces of interparticle interaction. The iconic sign which is concretized by the theatrical decoration *A* and *A'* resembles more a phoneme represented by various allophones. The differences that stand out in the case of the previously considered concretizations of the iconic signs of the tree originate from the fact that these concretizations belong to different distant elements of the systematization series which represents a gradual intensification of the feature "painterly," and simultaneous departure from the feature "linearity" (or — the systematization series which represents a gradual intensification of the feature "linearity," and simultaneous departure from the feature "painterly").

Similarly to the case of concretizations of linguistic expressions, one can ask the question about empirical criteria on the basis of which it is possible to establish that we are dealing with a concretization of such-and-such iconic sign in a given situation. This question corresponds to an essential and very complicated problem. I shall only state here, that in my opinion, the solution should be the same as the solution to the matter of empirical recognition of

a specific linguistic expression in its given concretization. It is particularly evident that the basis for such a recognition cannot be only the observed physical features of a given isolated linguistic or iconic concretization, but what also should be considered are the relations between the concretization and its context. However, both assigning specific features to a given concretization, and finding relations which bind it with the context, most probably follow from the initial hypothesis about the nature of the ideal type, which has its representation in a given concretization, and also — the ideal type concretized by the context. Physical features of the concretization and its contexts are empirically evident and either falsify or confirm this initial hypothesis.

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