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Intensional Splitting: An Empirical Examination of Conceptual Duality

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Certain words are extremely closely connected, regarding their meanings; such word pairs can be formed, however, not only with the well-known synonyms and antonyms, but also with words of clearly different meaning (e.g. LIGHT-PHOTON). Our studies show that, even in the case of real synonyms, there is a purely semantical – and consequently conceptual – difference between the parts/elements of the word pairs. Within the pairs there is an elementary conceptual accessibility between the parts; according to all indications this is the basis for the remarkable semantical connection. This close connection is the intensional splitting, the quantum of relation. It is assumed that it plays an important role in the semantical deep structure. Synonyms and antonyms are mere random marks of the existence of this relation on the level of the natural language. (Author)

*For radio astronomers Arno Penzias and
Robert Wilson*

I. Conceptual Doubling. Synonymy and Antonymy as a Close Positive and/or Negative Semantical Coherence

1. Synonymy and antonymy as conceptual relations

In the basic vocabulary of a natural language, it can often be observed that some words form *closely connected, coherent* doublets with certain other words. Creating doublets is a clearly semantical phenomenon which can be experienced by the natural feeling for language. It is so frequent that coherent words are usually not differentiated regarding their meaning when someone uses the language less carefully; in other cases, however, it seems that these words are completely exclusive from the semantical point of view. These doublets are generally known as synonyms or antonyms – the latter being words with opposite meanings. Synonyms are usually regarded as a conceptual equivalence, although a deeper analysis will show that synonymous words cannot replace each other either for stylistic or for logical reasons.

It is justified to assume that it is not a duality of words, but rather of concepts which lies in the background when creating doublets. The connection does not exist between mere words, but rather between concepts, and the same connection is involved in the case of synonymy and of antonymy.

This assumption is particularly supported by the fact

that an extremely close coherence can be observed not only for synonyms and antonyms, but also very frequently for other words that indicate clearly different concepts.

One concept is associated to another of all possible concepts, usually assigned by a natural feeling for language. This association is of a purely semantical character. No other relations, whether they be hierarchical (like generic, whole-part relations) or affective or appurtenance relations (like causality, instrumental relations, attributive relations, productive relations etc.) or comprehensive, inclusive or intrinsic relations, have any role in it. No coordinate relation is involved here, either, since the coherent concepts have no common, hierarchically superordinated concept. (What could be the superordinated concept for BRAIN and MIND, for DATA and INFORMATION, for MEANING and SENSE, etc.?) These concepts are most closely coherent when they are regarded relatively, i.e. when compared to known concepts, therefore always within the semantical context of the possible concepts, whether synonymy or antonymy is involved. For example: (it should be emphasized that it is regarded on the basis of the natural feeling for language, from a purely semantical point of view) of all the possible concepts – SOCIETY, CIVILIZATION, EDUCATION, KNOWLEDGE, SPIRIT etc. – it is CIVILIZATION which is the closest to CULTURE. Some further examples: REASON-UNDERSTANDING, CONDITION-STATE, EXISTENCE-BEING, FACE-VISAGE, SAD-UNHAPPY, NIL-NOTHING etc.

What is most remarkable is the very strong nature of this coherence. This extremely close coherence is the starting point for our studies: what does this mean, what lies behind it, what is common to real synonymy and to antonymy?

2. Synonymy as the closest positive semantical coherence – “nearness”

Synonymy which is well-known in the common language, belongs to this type of conceptual coherence. If the concepts are represented by their extension, the extension of the concepts (i.e. the denotation of words), such as MEANING and SENSE, FACE and VISAGE, SKINNY and SLIM etc., will be identical, while they are different connotatively. It is justified to raise the question: if identical things are involved here, how is it possible that these seemingly redundant doublings still exist in a language? Why are they so popular that even highly qualified purists of a language are fond of using them? Or is it likely that different things are also involved here?

The phenomenon of conceptual duality shows that a peculiar relationship exists here. Perhaps it is semantical similarity which is comparable to this; what is meant by CULTURE and CIVILIZATION is similar in a peculiar or, moreover, in a special way. Such a similarity is involved here which represents the closest possible conceptual coherence, namely, the utmost closeness (“nearness”) which, from a purely semantical point of view, is at all possible between two words, in the case of synonyms. The concepts associated in such a way have

almost identical intensions. In other words, from structural point of view the contents almost fully match.

The property of utmost "closeness" shows another, even more essential, elementary property: the accessibility or alternative of the concepts taken in a positive sense. It is as if the pairs of concepts expressed that one of the concepts included in the pair is accessible (feasible) for the other and vice versa. In further parts of this paper, similarity stands for the closest positive conceptual coherence, a strict similarity, as described under section 2. All other weaker similarities are called loose similarity at a conceptual level. For example: CULTURE-CIVILIZATION is a strict similarity, while CULTURE-EDUCATION, CULTURE-SPIRIT are loose similarities. Strict synonymy and loose synonymy correspond to these two phenomena on the language level.

3. *Antonymy as the most negative semantical coherence, "nearness"*

Another type of extremely close coherence described above is the opposite of concepts (of linguistic level: antonymy), like BEGINNING-END, NOTHING-SOMETHING, NOBODY-SOMEBODY, DISORDER-ORDER, GOOD-BAD etc.² As far as the extent and the intensity of the coherence are concerned, i.e. from merely formal aspects, it is impossible to find any difference between synonymy and antonymy (e.g. LIMITED-RESTRICTED and LIMITED-UNLIMITED). Both pairs are coherent to the same extent. As to the way the intension of the coherence and as far as the "distance" of the concepts is concerned, it can be said that the opposite represents the utmost negative "nearness" which can possibly exist between two concepts, regarding their intension. Also, it can be stated that between their intensions there is an inverse structural correspondence. Similar to synonyms, some accessibility or alternative is involved here, in the case of antonyms it is a negative accessibility or a negative alternative.

Regarding all these, it can be stated that for antonymy, i.e. for the utmost semantical "nearness" (= greatest distance) as a relation, the inverse relation will be coherence, i.e. the utmost positive "nearness" (= smallest distance) which is a purely semantical synonymy, instead of equivalence, i.e. the lack of distance.

4. *Chain of gradations or transitions*

Regarding the intensity of polarity, several grades of antonymy are distinguished in lexicology. These are: controversial (e.g. ORDER-. . .-DISORDER), complementary (e.g. SMALL-. . .-BIG), and converse (e.g. WIN-. . .-LOSE) antonymies (Agricola 1977). In fact, there can be transitions between utmost negative and utmost positive coherences. This is shown in gradations such as COLD-COOL-LUKEWARM-WARM-HOT. There is a strict similarity, a positive close coherence, as described under section 2., within these chains, between the pairs included in them. At the same time, there is an opposite here, too, to a certain extent, especially when the whole chain of gradation is examined.

These chains always lead us from "less" towards "more". In the case of the chain COLD-. . .-HOT it is the degree of heat, in the case of the chain BLACK-. . .-WHITE it is frequency, in the case of SMALL-. . .-LARGE it is quantized quantity, in the case of the chain YOUNG-. . .-OLD it is age, in the case of the chain IDIOT-CRAZY-STUPID-FOOLISH-SLOW-WITTED-DOCILE-SHARP-SMART-CLEVER-WISE it is the ability which changes.

5. *Complex-±-close conceptual coherence: representation*

A peculiar, complex version of the utmost conceptual coherence is represented by pairs like LIGHT-PHOTON, BRAIN-MIND, CONSCIOUSNESS-SPIRIT etc. Like similarity or antonymy, these also represent two basic manifestations of the *same* thing. The same thing can be regarded as two completely different internal structures or internal complexities, and this fact corresponds to two concepts! The basis of conceptual difference lies in this structural difference. It is well illustrated by the following sentence: "Culture is the mind of society, civilization is the brain of society". Pairs of concepts like CULTURE-CIVILIZATION, BRAIN-MIND or LIGHT-PHOTON are neither opposites nor similarities; all we can say concerning them is that the two concepts are alternatives of each other to a greater extent than any of all the other concepts, both in a positive and a negative sense.

6. *Utmost conceptual coherence and generic relation*

In fact, in each case of the utmost conceptual coherence described above, i.e. in the case of positive, negative and complex coherence, the same thing is involved: equal conceptual structures which are mapped onto each other! This mapping can be homomorphism (in the case of strict similarity or complex close coherence, e.g. BRAIN-MIND), it can be inverse homomorphism (in the case of a complementary and converse antonymy like BLACK-WHITE) or it can be a "losing relation" (in case of controverse antonymy like BRAIN-BRAINLESS, ORDER-DISORDER). The pair FACE and VISAGE represents two different structural versions of the *same* thing (= extension), similar to GOOD and BAD, BRAIN and MIND, HIGH TIDE and LOW TIDE or MOLECULE and COMPOUND. Similar to 1 and -1 which represent the same if they are deprived of their sign. One thing is involved here which is two things at the same time, just as light is both a wave and a particle at the same time.

It is generic relation which is closest to this close conceptual coherence if the identical extensions are regarded. There is only an internal, intensional, structural difference between TERRIER and DOG, BAD and PROPERTY, COMPOUND and COMBINED SUBSTANCE, otherwise they represent the same extensions. In the case of TERRIER, DOG, BEAST OF PREY, LIVING CREATURE, BEING and SOMETHING we can point to the same thing all along the chain if we want to identify it using our organs of sense.

In the case of the generic relation, however, the in-

tensional difference is principally quantitative: the more general concept has fewer characteristics than the more specific concept; it has a simpler structure, but the type and character of the structure are the same. Essentially the same internal structure is involved in the case of genus as is in the case of species, but the former is constituted by fewer distinguishing marks. In the case of the close coherence discussed here, however, it is not this quantitative difference which is significant: it is the *arrangement* of the structure itself which is principally different! (Pairs like CONSCIOUSNESS-SPIRIT, LIGHT-PHOTON, BRAIN-MIND should be considered; but the same applies to WHITE-BLACK, TERRIER-DOG, too).

7. Identity as a zero-relation

Identity also stands in a close relationship to accessibility, as discussed above. Identity as a "relation" is a peculiar case among concept relations. Similar to the fact that two identical physical things do not exist, any two identical concepts do not exist either. On the basis of a merely conceptual approach, the identity relation is the zero element among the conceptual relations. In the case of identity there is no other concept or other structure involved (the value of the "distance" is zero): accessibility or alternatives cannot be shown empirically. Identity, therefore, is not an antithesis of accessibility because it does not imply inaccessibility!

From a conceptual point of view, this relation represents the beginning of the world of intensions, "contents", i.e. the zero "distance", where all the similarities (+) and all the opposites (-) still coincide; where the conceptual relation as such is still "nought".

The opposite is the closest possible negative coherence, strict similarity is the closest possible positive semantical coherence. Identity (equivalence) is not an inverse relation of similarity, i.e. of the utmost positive semantical coherence, but is a lack of any kind of semantical coherence. The opposite of synonymy is antonymy; at the same time identity (equivalence) is the opposite of both synonymy and antonymy: in the case of identity no different concepts are involved, therefore no empirical concept relation is involved either. Identity is the lack of an elementary semantical field.

Identity lies only in the fact that two signs refer to the same thing (this is equivalence). Equivalence does not exist apart from the world of signs (in the world of facts), among things and concepts; it is only an extremely high similarity (= extremely slight opposite) which exists there. In formal logic it is equivalence (=) and non-equivalence (\neq), in the world of concepts it is similarity and opposite which are (b) analytical. Both pairs are fundamental – or perhaps: banal – means of thinking.

8. The creating of pairs is a universal phenomenon which occurs in different cases in each language

The coherence within a set of words observed on the basis of the natural feeling for language cannot be found in the same cases as for another set of words. E.g. the concept INFORMATION can constitute a pair with

KNOWLEDGE within such a set of words where DATA is missing; this pair is characterized by the highest semantical accessibility; while within another set of words where KNOWLEDGE is missing, INFORMATION can be associated with ENERGY, etc. The closest coherence can be clearly determined only if the whole vocabulary is regarded³.

Doublets vary in each language and in different periods. But all this does not influence the fact that languages always have such concepts which are characterized by this duality. In the English language, the concepts of the German KENNEN-WISSEN are missing, while it is impossible to transfer in German the duality involved in BRAIN-MIND in English.

Recognizing these doublets requires certain technical, professional knowledge. In the case of ENERGY-QUANTUM the closest coherence cannot be recognized without knowing the basic views of contemporary physics. As these views change, this pair of words will gradually fade out and later completely disappear from the language – to show up at another place which is becoming important – to be represented by two other words. In many cases, it is only literature and the application of a language at an artistic level which will keep this duality unconsciously (as e.g. in the case of MEANING and SENSE), and it will only be later that a more differentiated, scientific approach will give the elements of the pair a role which is more than stylistic (e.g. in the case of BEDEUTUNG and SINN, it was Frege who started to use these two words in the sense of "denotation" and "concept" ("intension") respectively, or in the case of MEANING and SENSE, it was Montague who used these words in the sense of "absolute intension" and "contextual intension", respectively). It is most likely that a certain subtle distinction is already shown by the feeling for language, before the difference is discovered more precisely by scientific examination¹⁰.

On the basis of the above, one could have the impression that the close coherence described here must appear. Could this perhaps be an "elementary view"? An "archetype" of the relations? The "beginning" of concept?

A concept can be associated to another concept in the closest possible, positive semantical "nearness", and at the same time it can be associated to another concept in the closest possible, negative semantical "nearness". (E.g. the "nearness" between ALTERNATIVE and POSSIBILITY is the closest possible positive nearness, while for POSSIBILITY and IMPOSSIBILITY it is the maximum negative "nearness").

On first sight, it is also possible to believe that a word could have more than one synonym (i.e. this word is associated to several other words with a maximum nearness). A thorough examination will show, however, that the reason why it seems so is that, within the set of words (synonymous field), each of the possible pair of words will constitute pairs with other pairs. This is illustrated in Figure 1. Within each group of synonymy or antonymy there is always a concept which is closest to a given concept, compared to the closeness of the others (see Part II)!

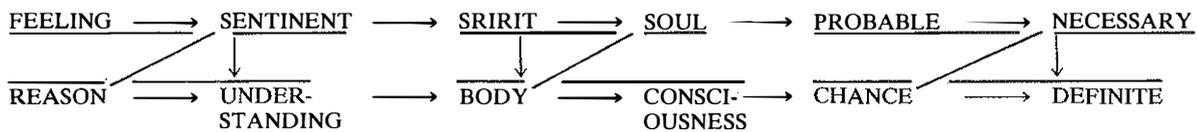


Fig. 1: The close conceptual coherence inside the integrative level (e.g. SPIRIT-SOUL or BODY-CONSCIOUSNESS) and between integrative levels (e.g. SOUL-CONSCIOUSNESS or SOUL-BODY).

9. Close conceptual coherence within and between integrative levels

These examples show that the conceptual coherence discussed here has two manifestations. It appears either at the same level of things or among things belonging to different integrative levels⁴.

This is illustrated by the following pairs: SOUL-SPIRIT → BODY → CONSCIOUSNESS. The first pair exists *within* the level of the “spiritual, emotional, less determined”. On the other hand, those closely coherent pairs such as BODY → SOUL or CONSCIOUSNESS → SPIRIT, BODY → SPIRIT and CONSCIOUSNESS → SPIRIT exist *between* the two levels mentioned above. This first form of coherence is called “horizontal”, the second “vertical” coherence (the hyphen indicating a “horizontal” form, → indicating a “vertical” form of coherence). Whenever a “horizontal” and a “vertical” version meet, a “diagonal” coherence is also detected by the feeling for language; (in a common language the pairs BODY → SOUL or CONSCIOUSNESS → SOUL represent this “diagonal” relationship, i.e. the matching of pairs). This is, however, already the result of the fact that pairs are created both in a vertical” and in a “horizontal” direction.

Highest accessibility is represented by “horizontally” coherent pairs within the same integrative level, while it is represented by “vertically” coherent pairs between the integrative levels. Something like this can be observed e.g. in the case of CHANGE-DEFINITE or PROBABLE-NECESSARY (the first has a more specific, concrete character, the second a less definite, more abstract, conceptual character). Pairs like CHANCE → PROBABILITY, DEFINITE → NECESSARY, DEFINITE → PROBABLE seem to be integrative level dualities; all these pairs are based on “diagonically” synonymous or “diagonically” antonymous relations. One of the best known integrative level dualities is: BRAIN (physical level) → MIND (spiritual level), or CIVILIZATION → CULTURE and PHYSICS/CHEMISTRY → BIOLOGY.

II. Examination

10. Experience based on the sense for language

The coherence described here is of a language-aesthetical character. This is a semantical relation which cannot be recognized, in most cases, without a feeling for language. It can be decided only by relying on the feeling for language that e.g. of BROKEN, CONTINUAL and TOGETHER it is BROKEN which is closest to INTERRUPTED; CONTINUAL which is closest to DISCRETE and TOGETHER which is closest to SEPARATE. The feeling for language acts like a certain kind

of “mathematical measure” in the field of semantics. The “Well-formed” outlook of the conceptual relations discussed here is a result of such a process which could perhaps be best characterized by the autopoiesy of Maturana (1982).

The relationships discussed here are based on such properties of concepts which are valid only when compared to other concepts. Since they can be grasped empirically, due to the activity of the feeling for language, the existence of the relation described here was checked in an experiment.

11. Description of the experiment

The method applied for the test was similar to the semantical differential by Osgood (1957), but instead of three factors (“good-bad”, “strong-weak”, “active-passive”), only one (“less graspable-graspable”) was applied, and instead of individual concepts pairs of concepts of a given set of concepts were tested.

Persons involved in the experiment were given the explanation as to what is meant by the “less graspable-graspable” factor, using the following pairs of words:⁵

“less graspable (impossible to grasp)” more indistinct	or	“more graspable (graspable)”: more distinct <i>compared to each other</i>
dimmer		brighter
more transitional/interim		more durable/lasting
more momentary		more fixed
more temporal		more spatial
more relative/relational		more absolute/elementary
more continuous		more discrete
more fieldlike		more quantized
deeper		more superficial
more internal		more external
more abstract		more concrete

Using the following pairs of properties information was collected as to the direction of the relation:

more determining	or	more determined <i>compared to each other</i>
more effective		more subject to effects
more operative		more operated
more generating		more generated
more resulting		more resulted
earlier (beginning)		later (finished)
causing		caused

During the first phase of the test the persons involved in the experiment were given 30 words arranged in alphabetical order (words underlined in Table 1). There was another list containing 150 words; out of these 150 words those had to be selected which were closest to any

<i>"less graspable impossible to grasp"</i>	<i>"more graspable graspable"</i>
<u>NONENTITY/DEATH</u>	BEING/LIFE
<u>NOTHING/NOUGHT</u>	<u>SOMETHING/SOMEONE</u>
<u>ENERGY</u>	<u>QUANTUM</u>
<u>CONTINUOUS</u>	DISCRETE
<u>LIGHT</u>	PHOTON
<u>QUICK</u>	SPEEDY
<u>THEME</u>	<u>TOPIC</u>
<u>OPPORTUNITY</u>	CHANCE
<u>INDIVIDUALITY</u>	<u>PERSONALITY</u>
<u>MIND</u>	BRAIN
<u>SOUL</u>	CONSCIOUSNESS
<u>SPIRIT</u>	<u>GHOST</u>
<u>EQUAL</u>	IDENTICAL
<u>BEGINNING</u>	<u>START</u>
<u>VISAGE</u>	<u>FACE</u>
<u>UNDERSTANDING</u>	REASON
<u>CASE</u>	INSTANCE
<u>INFORMATION</u>	DATA
<u>ORDER</u>	SYSTEM
<u>NATURE</u>	SOCIETY
<u>CULTURE</u>	<u>CIVILIZATION</u>
<u>PRODUCT</u>	<u>WARE</u>
<u>WORTH</u>	<u>PRICE</u>
<u>PROBABILITY</u>	NECESSITY
<u>ALTERNATIVE</u>	<u>POSSIBILITY</u>
<u>STATE</u>	<u>MODALITY</u>
<u>IMPOSSIBLE</u>	<u>POSSIBLE</u>
<u>ABSTRACT</u>	CONCRETE
<u>UNIVERSE</u>	COSMOS
LEADER	<u>FÜHRER</u>
COLOGNE	<u>KÖLN</u>
SATELLITE	SPUTNIK
HUNGARIAN	<u>MAGYAR</u>
<u>DOG</u>	CANIS

Table 1. For the underlined words the persons had to select from the 150 similar words which are the closest coherent ones. After this they had to decide on two words – fixed pairs – which represent the concept “more graspable” resp. “less graspable”. More than 80% of the persons taking part in the test chose the words given in the result.

of the first 30 words, from a semantical point of view, compared to the other words.

In order to make the selecting of the words more difficult, the list containing 150 words was arranged in such a way that to each of the words 4–6 words with similar meanings were attached within the list (e.g. next to CIVILIZATION the words SOCIETY, MANKIND, EDUCATION, SPIRIT, WAY OF LIVING, BEHAVIOUR were also mentioned in order to make the finding of the pair of CULTURE more difficult).

The result showed a high level correspondence in the evaluation of duality examined: *more than 80% of the persons involved in the experiment voted for the matches shown in Table 1.*

During the second phase of the experiment the direction of relation within the pairs selected had to be determined. The results are shown in Table I. When there is a correspondence of 40%–60% concerning the direction of relation, both directions are shown in the table. In the case of more abstract pairs, the directions were strongly influenced by the views the persons questioned have

about the world. (The order of the pairs was not determined by the persons involved in the experiment).

In the second phase, 5 previously determined words were added to the 30 words mentioned above. (In the Table, these are the words below the horizontal line of separation). The results show that words of foreign origin – due to the lack of common application – have lower “contents”, therefore they seem to be more “concrete”, more “definite” for the feeling for language. This supports the assumption, too, that, between a word of a mother tongue and its foreign counterpart, there is a close semantical coherence based on the feeling for language; this semantical coherence is the subject of our examination. From this a seemingly absurd, but in the practical application of languages, an actually observable consequence can be drawn, namely, that if a foreign word is used in the context of the mother tongue, then it does not indicate the same concept as if the corresponding word of the mother tongue had been used instead of the foreign one. In other words, the biologist does not mean completely the same when he uses the word CANIS as when he uses the word DOG. He – similar to physicians – prefers to use the foreign word because the concept corresponding to the foreign word is more determined than the concept which corresponds to the mother tongue word.⁶

12. The temporal equivalent of the close conceptual coherence: verbal-processual coherence

Certain pairs of words cannot be evaluated with the pair of properties used by us. Such pairs can be formed by verbs (and by nouns formed from verbs), if these are arranged with the help of the pair of properties “earlier (beginning)-later (finished)”. PROPOSITION-ACCEPTANCE, DESIRE-DISAPPOINTMENT, DEPARTURE-ARRIVAL etc. These are converse antonyms. The chain of gradation developed in such a way is called “kind of action” (“Aktionsart”). They can be especially well observed in Ballmer’s (1983) classification system of verbs. In this chain or dimension, the words represent different stages of a given process: the beginning, the duration, and the end (or by linguistic terms: terms like stative-inchoative-accelerative-durative-elaborative-terminative-postparative-reflexive etc.). Such chains or such pairs of concepts are held together by a temporal order, and a temporal contradiction can be detected within them. (e.g. THINKING-DECISION-SPEAKING-HEARING-UNDERSTANDING-AGREEMENT/REFUSAL).

The “kind of action” is similar to the chain of gradation of COLD-. . .-HOT discussed under section 4. That chain of gradation is structured by different substantial, spatial grades of property. The dimension formed in this way can be called “degree of quantity” (since the grades of property of the “action”-carrier medium, i.e. substance, are manifested in it semantically). The factor of the pairs of “kind of action” is “earlier-later”, the factor of the “degree of quantity” is “less(smaller)-more(larger)”.

Apart from the “kind of action” a completely new chain of gradation was developed by Ballmer (1983),

namely, the “degree of influence” (“Eingriffsgrad”): its name shows that along this dimension the carrier of the process, the subject of it has greater and greater control over its environment; the interaction with its environment becomes more and more intense. This will lead from the mere fact through biological activities and social actions up to discursive acts. The subject of the process is becoming more and more complex in the meantime. At the beginning, there is no subject at all (be, valid, go on, it rains etc.) then inanimate objects appear (rise, exist, cease, etc.), it is followed by living creatures (wake up, live, die) and subjects of plants, animals and humans (e.g. BEGINNING-RISING-BIRTH-WILLING-RECOGNITION or EXISTENCE-COURSE-ACTIVITY-MAKING-ACTION-THINKING etc.).

In this dimension, the pairs observed as coherent ones, could be characterized by the “less influenced/less formed under influence (unformed) – (more) formed by influence” factor which in turn is remarkably coherent to the pair of property applied in our study; while the “earlier – later” pair is rather its opposite.

The “kind of action” – according to Ballmer (1983) and Ballmer-Dreher (1983) is related to the ontogenesis of “things, organisms and activities: processes having a beginning and an end are connected in the dimension. On the other hand, along with the “degree of influence”, an open process takes place: this is cosmological philogenesis having typically human activities at its highest – present – level”. Both dimensions, are, in fact, the verbal-processual equivalents of the substantial-substantial, spatial “degree of quantity”. The “kind of action” is its temporal opposite (negative close coherence), the “degree of influence” is its temporal similarity (positive close coherence).

The main thing is: within and among all the three chains of gradation the same relation can be encountered; this is the positive and negative close conceptual coherence. And *this* is sensed by the natural feeling for language.

It can be stated, therefore, that the two basic dimensions belonging to the classification system of verbs by Ballmer, as well as all the other “kinds of action” (Ballmer, 1983. Comment 9) and the pairs of words examined by us are based on the same close conceptual coherence. The same applies to strict similarity (real synonyms), too: they are different from a conceptual point of view, but the former dimensions coincide in them. They are different according to the factors of “graspable” and of “temporal” (“more previous-later”) as well as to factors of the “spatial” (“less-more”); but the difference is the greatest when it is regarded according to the first factors. This coherence completes the function of a constructional unit, according to all the indications, in a rather primary form.

III. Interpretation of Results: Quantum of Relation

13. The meaning being quantized

The close conceptual coherence studied here is not identical with any of the known relations. It includes similar-

ity, representation and the opposite, although no coordination in the traditional sense is involved, since the concepts connected have no common superordinated concept. To which concept are e.g. BRAIN and MIND, DATA and INFORMATION, BEGINNING and END, ORDER and DISORDER subordinated? They are connected only by the subject contemplating them (Pittioni 1984)⁷.

According to all the indications, this coherence is based on the difference in the internal structure of the concept. The difference in the structure or in the complexity can be grasped as an opposite of a certain kind, which can be observed even in the case of perfect synonyms – which are strict similarities. This difference, however, can be observed only if some things are coherent.

This coherence is, in fact, the elementary form of distinction, which is the simplest act of thinking and which forms a basis for all further understanding. This elementary form, as an archetype of the relation, is maintained by the semantical structure in the form of closely coherent pairs of concepts. Also, it can be stated that this coherence is the elementary unit of understanding: it is the quantum of relation. The structure of this quantum is shown in the table below:

Identity	∅I	no relation; no semantical field
Closest conceptual coherence manifested in the form of a positive synonymy: similarity	+I	positive unit of relation; semantical field included
Closest conceptual coherence manifested in the form of a complex ± representation: representation	+	unit of ± relation; semantical field included
Closest conceptual coherence manifested in the form of a negative antonymy: opposite	-I	negative unit of relation; semantical field included

The understanding, the contents are quantized. Anything which can be in contemplation can be thought of within these limits only, built up using these units. Nothing can be identified more precisely than a similarity and nothing can be distinguished more than the opposite.

This fact is an everyday experience which is, however, concealed by the rationalistic approach. the follower of the rationalistic program separates the physical from the spiritual, the substantial from the conceptual, the terrestrial from the celestial. Therefore he is forced to identify (measure) things with things and with nothing but things, or at least he believes that this is what he does. In fact, identification (measuring) cannot be done without a brain manifested (operating) as a mind. According to all indications, the brain manifested as mind carries out identification (measuring) in a quantized way. For when mind is mind, i.e. mind is the operation of the brain, it is not a brain, since the operation is not identical with what is operating, even in spite of the inseparable coherence of the operation and of what is operating!

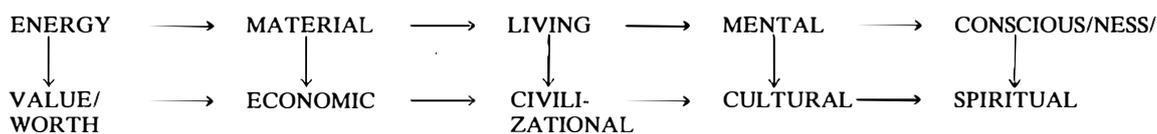


Fig. 2: Integrative levels, arrangement on the basis of close conceptual coherence.

In other words: when grasping something from the conceptual point of view, it is, in principle inevitable to have two (or perhaps: at least two) inseparable concepts occurring at the same time: neither of them can represent the given thing properly.

A semantical field has both “internal” and “external” limits. This fact could perhaps be formulated comparatively as follows: the semantical field is “curved.”

14. Quantizing – delimiting – as the “distance” between the carrier and the sign

Regarding structure this relation can be understood as the relation between the carrier and the carried. One of the concepts plays the role of the carrier of the other concept. It is as if a concept could not only be the sign of a denotate, but also one concept could be the sign of another concept (and therefore one thing could be the sign of another thing). This can be observed in the case of pairs such as MATERIAL-ENERGY, PHOTON-LIGHT, BRAIN-MIND or CIVILIZATION-CULTURE⁸. In this sense, antonymy means that one of the concepts (e.g. GOOD) can be a “sign” of the other concept (e.g. BAD) only to such an extent as it is not designated by the first concept, and synonym means that one of the concepts exists only to such an extent as it designates the other concept (e.g. TERRIER-DOG).

Through the chainlike repetitions of this relation, more and more complex integrative levels are built upon one another (see Figure 2)⁹.

It can be assumed that quantizing – delimiting – is the distance between the carrier and the sign: the smallest possible leap that can be grasped.

Due to the fact that one concept carries the other, the concept which is carried will be realizable by the carrier concept. (This relates to the chains of verbal relations discussed by Ballmer, in the direction of the “degree of action” and the “degree of influence” / “Eingriffsgrad”, (Ballmer-Dreher 1983). These chains of relations provide the basis for determining whether a concept is an alternative – regarding the other concept – or it is not. By the term alternative, an elementary, and – from the semantical point of view – an absolutely valid alternative is meant. This alternative can be grasped by the feeling for language: and feeling for language means the ability to grasp such alternatives. Instead of an alternative, a rather more geometrical comparison, i.e. symmetry, could also be applied¹⁰.

The relation examined provides a unit of accessibility among the concepts, similar to that of the two possible worlds in modal logic (Kripke 1963). By the term “world” is meant, that to each pair of concepts the same discussion universe belongs: this universe is determined by the total vocabulary of the language at a given moment.

These accessibilities constitute a structure which lies principally in the background of the conceptual or semantical phenomenon. Only a few elements of it appear on the surface of the language similar to the top of an iceberg: these are synonyms and antonyms.

15. Tolerant opposition: intensional splitting

From the results of the examination, the conclusion can be drawn that each similarity is based on opposition. In other words, opposites are similar!

Since this coherence connects even the greatest similarities via opposites and vica versa, it can be regarded as a “tolerant opposition”; and since it is an elementary conceptual difference, it can be regarded as an “intensional splitting¹¹”. Also, since the measure cannot be exceeded by any relation in either a positive or a negative sense, the limit value is the quantum of relation.

Intensional splitting can be well illustrated by the nature of light. As light is, at the same time, a photon and a wave phenomenon, similarly the intensional splitting is both a relation and a quantum of relation at the same time.

All the other relations result from this kind of splitting. In other words: all the conceptual relations (e.g. generic relation, partitive relation etc.) are built up on this quantum of relation, therefore they are also quantized. The other relations represent further, less subtle splittings leading from the intensional microworld towards the macro world. In order to recognize relation and this way to recognize concepts, the conscious/spiritual impression of the intensional splitting was/is required.

This splitting can be grasped with the help of pairs of properties, i.e. factors. These factors represent the three most general elements of approach: spatiality (substantiality), temporality (processuality) and spatial-temporality (evolution, representation). Three basic types of close conceptual coherence can be recognized accordingly: complementary opposite, converse opposite and representation. (In the case of strict similarity and converse opposite, all three basic types coincide. They are the primary forms of intensional splitting).

Intensional splitting is in effect even in the smallest detail of meaning, of semantics. Synonymy and antonymy are only the visible forms of its manifestation on the surface of the language; they are merely marks indicating an intensional deep structure that makes the creating of concepts at all possible. This deep structure consists of alternatives, accessibilities, comparisons and distinctions of different intensity, grasped long ago by the intellect, confirmed immeasurably many times by culture, and stored archetypically by collective memory in the form of the language spoken. And these alternatives are

		Spatial-substantial	Temporal-processual	Temporal-spatial
graspable	complementary opposite in space degree of quantity	"less-more" ("smaller-bigger")	---	synonymy contraverse opposite
	converse opposite in time kind of action	-	"more beginning-more finished" ("more previous-later")	
	representation in space-time degree of influence	"less graspable-more graspable"	"less formed under influence-more formed under influence"	

quantized: they are built up from intensional splittings – quantum of relation – which are the constantly valid structural elements of meaning. This is indicated by the fact that in the everyday usage of a language it is in effect even words with completely identical meanings: this is how words of foreign origin take over the role of more precise definition as compared to terms in the mother tongue. This fact was confirmed by our examination.

16. The importance of intensional splitting

Pairs of concepts sensed as synonyms, antonyms, or representation, are random marks of the semantical deep structure on the surface of the language. They can be encountered in every language, although they vary in each language and in each age. In principle, however, each thing can have two (or perhaps at least two) equal versions, therefore each thing can have two (or perhaps at least two) equal concepts. No PARTICLE exists without a WAVE, there is no SYMMETRY without ASYMMETRY, there is no EARTH without SKY and there is no HEAVEN without HELL. This unit of duality plays the same role for understanding as is played by ± 1 among numbers. Those who can understand this duality will be able to create a concept just as those who can understand what *one* means will be able to learn how to count.

Therefore the question, in fact, is not why synonyms and antonyms exist at all, but rather why the pair of *each* concept is not indicated in a language^{10,12}.

It depends on the sophistication of thinking to which extent we are aware of these pairs of tolerance. The fact that not each of them is expressed in a language represents the assymetry within this theoretically given symmetry; and it is in fact this assymetry which can serve as a basis for drawing conclusions as to the real nature of the semantical deep structure which is the structure of the mind. This is similar to the conclusions drawn as to the

formation of the early universe from the cosmical background radiations coming from all directions of the universe, detected in 1964¹³.

Intensional tolerance represents a unit of alternative or a unit of accessibility free from any intension: this is the primary form of comprehension. In other words, it could be called a unit of intensional-semantical symmetry. It gives information about that original, primary intellectual impression which is no longer based on mere sensual experience or on the observation of this experience – i.e. on mere association – but rather on the grasp of observation which contributed to the creation of concepts, of classes and via these of cognition.

Notes:

- 1 Mentioning the existence of basic vocabulary is, for the time being, an assumption based on the natural feeling for language. Wahrig (1978) attempted to determine the basic German vocabulary by the computerized processing of his own vocabulary definition. This non-intellectual method resulted in a surprisingly high number (13.000 basic words). Ballmer (1983) studied exclusively verbs; classifying words in an intellectual way, from a semantical point of view, ("within their own contexts"), he obtained approximately 1.300 categories of verbs which can further be grouped into more general categories.
- 2 Opposition should not be mixed up with negation. DISORDER is not a negation of ORDER, BLACK is not a negation of WHITE, i.e. they are not complementary sets to the extension of ORDER and BLACK, respectively, but they represent something which is opposite to the *species* of ORDER or BLACK. On the basis of Strawson-presupposition, the same *q* will result from both *p* and *non-p* (in other words: ORDER and DISORDER presupposes a common concept which is not indicated by the language). Ballmer-Dreher (1983) referring to this special argumentation of relevance logic point to the fact that a process and its opposite process imply a common carrier process (these authors call this "basis-process"), which maintains the pair of opposites. (E.g. from ACTIVITY and NONACTIVITY a WAKING STATE is resulted, or from WAKING STATE and SLEEPING LIFE is resulted, etc.).

- 3 Abstract concepts do not clearly concern reality, therefore their classification is not possible on the basis of the things represented by them but only on the basis of other abstract concepts. In this context, Ballmer (1983) mentions a "situational dependence on context".
- 4 A difference of this kind is mentioned concerning Währig (1978). Scheele says the following about the German synonyms ANFANG (= beginning) and BEGINN (= beginning): "My feeling for language dictates that BEGINN has a temporal, ANFANG a spatial character." Währig also agrees that, even in the case of this perfect synonym, complete equivalence cannot be mentioned.
- 6 The test was made in Hungarian. For those synonyms of the Hungarian language which cannot be translated, English synonyms were selected, therefore the results of the test do not relate to pairs of words of the English language. The experiment required a lot of explanation, since the precondition of its success lay in the sophisticated understanding of the meaning of the words. Of 100 persons involved, 50 gave up, due, therefore to the small number of participants, the results are not confirmed statistically.
- 7 Pittioni regards the relationship between the opposite parts and the whole to be the result of the simplest operations of thinking, such as e.g. distinction: ". . . A is grasped as something different from B. In its background, however, a superordinated C should be implied, which includes both A and B, (and even perhaps the subject who makes the distinction) . . . At the time of the distinction, C is not present, at least not in the sense as A and B are, still the distinction could not take place, A and B / as things to be distinguished / were not suitable to be thought about, if this C did not exist." This is essentially the basis for the Swanson-presupposition as well as for the "podieren" relation of Ballmer.
- 8 In another study (Ungváry 1984), it was mentioned that it is probably the law of Bühler on the nature of the language as signs, which lies behind this relation. The duality of the "carrier" and of what is "carried" (= sign) appears among the concepts, too, due to this relation: one concept will be a carrier of the other.
- 9 On the basis of these chains of relations it was attempted to develop a threedimensional system of subjects and fields of knowledge (Ungváry 1985).
- 10 Behind this superimposed structure of the concepts carrier layers of the mind are supposed to lie. Conceptual universe can also be regarded as an impression corresponding to the functional structure of the mind. According to this a concept is an impression of the shell-structure of the mind. When self-excited, it appears in the consciousness in the form of a representation system. (Osgood, p. 324). Ballmer (1983) goes even further when supposing that the classification system of verbs discovered by himself and the periodical system of Mendelejev "are parallel not only in the sense of a metaphor".
- 11 This is something like the "higher order doubling" ("Entzweiung höherer Ordnung") by Othmar Spann – which sounds a bit romantic nowadays. According to Spann, this is what happens when a whole splits into two parts which are exclusive to each other and which have no common genus-concept (superordinated concept), although they are derived from some whole: creation starts with the splitting of something like MATERIAL and SPIRIT. Neither of them has any priority over the other. Instead of saying this "WHOLE" we can now say: *the* (still possible, only potential) CONCEPT. In any case, this is in conformity with the interpretation of the theory of Spann by Pittioni (1984): Instead of CONCEPT, Pittioni talks about the SUBJECT, which is more usual in philosophy, and its activity, e.g. projection. Recognizing concrete and more and more concrete concepts and conceptual relations *starts* with intensional splitting, i.e. with the subjective grasping of the opposite. But all of these contain the very first, earliest element of the process: the intensional splitting manifested in the form of an opposition. This is where the statement "the object

cannot be recognized without the projection of the subject" is manifested.

- 12 Intensional splitting is viewed to be as old as culture. It happened very frequently that, instead of concepts, things were regarded to be coherent. In the natural system of the symbols of mankind, there is a connection between the things of the external world and the organs of sense detecting them, i.e. between macrocosmos and microcosmos (the two levels of semantics). Therefore in many cultures the eye and the sun were regarded to be coherent, this leaves its mark in some languages where the etymology of eye and sun is the same. „Comparing the eyes and the sun is as old as mankind. This comparison is not based on science . . . Sometimes it is worthwhile to have a look at this world from which the springs of scientific hypotheses may arise" – as the Russian physicist of the eyes, S.I. Vavilov writes (cit. Stepanov, 1976. pp. 235). There is an endless number of such connections today, too: the coherence of light and cognition is regarded as natural today. Even if these mythical comparisons are not regarded as scientific, it does no harm to keep in consideration that the starting points of science are usually comparisons of this kind.
- 13 The radio engineers of Bell Telephone Laboratory, Arno Penzias and Robert W. Wilson, were looking for an undisturbed range of wavelength for telecommunication satellites. This is how they discovered that the universe is filled with a steady electromagnetic noise coming from all directions, corresponding to a temperature of 2,7°K. Relying on the properties of this background radiation, it was possible to retrace the events which happened during the very first few millionths of seconds of the early universe.

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