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Universal Principles of Thinking

Contents

0 Introduction

When I changed after my doctorate from physics to linguistics, I heard from both sides negative prejudices against the other discipline. In this situation, I remembered the thesis of C. P. Snow (1967), who said that natural science and humanities are two different cultures, which do not understand each other.

I saw corroborated his thesis by my personal experience, but I found as well the reasons for this gap in understanding: both sides are not informed enough about the other side, and if they are, they estimate the view in the other field as not adequate according to the own standards. The ways in thinking seem to be too different.

But is this true? Comparing my knowledge and my ways of thinking in both fields, I discovered that if we go to a higher level of abstraction, we find similar strategies in thinking. The discrepancy in understanding comes from this: the specialists are not interested in this higher, too abstract level, because the strategies must be concrete enough for the special problems they have to treat.

Therefore, I tried to find out whether there are principles in common in humanities and natural science. My hope was to find something, because our instrument of thinking is always the same: our brain.

Here I propose some of my findings. They have to do with the human interest in

organizing thoughts and with the relation between thought and its expression in language. I call them "principles".

What is a principle? It is a guideline serving to regulate a thought or an operation in thinking like an air corridor that pilots the approach of an air plane. The thinking movement is retained within the limiting constraints defined before. That is: the principles control the degrees of liberty in thinking and in rational behavior. The principles proposed here are universal in the sense, that they are widely applicable to thinking, feeling, acting and speaking in general and in sciences. They are important as well for heuristics: they can pilot the first approaches to an explanation.

I use as well the words *model* or *theory* mainly for the description of the complex structures behind the principle.

Each principle has a *descriptive* aspect as far as it describes an existing scientific behavior. It has a *prescriptive* aspect as far as it claims to follow the path once chosen. Therefore a person is free in choosing the principle he wants to use, but then he is bound to remain coherent with this principle.

I'm going to propose 14 such principles. Each principle is structured according to a common schema or grid with the 6 entries:

- **IDEA**
- **PRINCIPLE**
- **DESCRIPTION**
- **EXAMPLE**
- **APPLICATION**
- **HINTS (LIT, REF,TRA)**

with the following characteristics:

IDEA: This part has an introductory function: it leads to the principle starting from observations in different fields and tries to make plausible how thinking tries to treat phenomena according to some general idea.

PRINCIPLE: It contains the formulation of a guide line in simple words to give the main idea of the principle.

DESCRIPTION: The formal structure behind the principle is explained in some detail without being too formal.

EXAMPLE: As illustration for the principle we some examples, mainly from daily life.

APPLICATION: Since the idea behind the principles is the hypothesis, that our thinking has common characteristics independent from whether we think in natural science or in humanities, some hints for the scientific application will be given:

- From natural science
- From Humanities and herein
- Mainly from Linguistics and Translation Theory.

Since the issues treated in the application are taken from the basics of the correspondent scientific field, it is not necessary to give extensive references.

HINTS: contain comments, supplementation, exceptions.

LIT: contains hints to the works of the author and of others regarding the principle itself or its historical background, whereas

REF: contains works with applications of the principle.

TRA: contains references to the applications in the special field of *Translation Theory,* which are treated in the subsequent contributions of this volume.

The principles are:

1. Fan-Fixing-Principle
2. Principle of Atomism, Holism and Hol-Atomism
3. The ICS-Principle (individual, collective, system level)
4. Principle of Kommunikant Views
5. Utterance Model of Language (hexagon model of language use)
6. Theme Rheme Model
7. Sense-giving model
8. Action model
9. Speech Act Model: a special case of the action model
10. Tetrade Model of Speech Acts
11. The Concept of Scientific Method: a special Case of the Action Model
12. Pragma-logical Inference: a special Case of the Action Model
13. Holistic Logic. a special case of pragma-logical Inference.
14. Principle of Scientific Work

The 14 principles have a constructive order: since a principle can be built on the ground of another principle, the more basic principles come first (cf. summary).

1 The Fan-Fixing-Principle

IDEA: In your actions, some you can choose from a set of alternatives depending on the *purpose* of your action and some are *necessary* consequences of your choice.

Therefore, the principle treats the change between free choice and no choice in certain situations. "No choice" means: you can *infer* consequences necessarily from your decision: I call this a *pragmatic logical* inference (cf. 12. principle).

PRINCIPLE: Either you can decide between various possibilities (the "fan" of possibilities). In this case you have to choose (to "fix") one of them. After your decision, you are bound to it without alternative. I.e. you *necessarily* have to follow the way you have chosen, if you want to attain your aim.

DESCRIPTION: If a person K with a given aim arrives in a situation at a *decision point,* K thinks of a *fan of possibilities (*alternatives) for going on.
Then K has to fix (= choose) one of these possibilities.
Afterwards K has to proceed *inevitably* according to his laws or rules and his logic, until he reaches the next decision point or the intended aim.

EXAMPLE:
e1 From daily life: If you are at a crossing point in a street and you want to reach a

determined aim, you find maybe 3-4 possibilities to go on (the fan), so you have to decide in which direction you like to go. After you have decided (fixing), you follow the street necessarily to the next crossing point. What is necessary, can be foreseen by a logical inference (if one defines "inference" in a pragmatic way to cover the necessities in daily life considerations, cf. 12. principle).

e2 We are so familiar with this principle, - it is used in so many situations that I think it is not necessary to give further examples here.
But consider this: many of our decisions are intuitive and automatic and thus without the reflection on alternatives, even if there would be alternatives. Therefore, it is useful to reflect on them.

APPLICATION:
a1 *from natural science*: if you prepare an experiment you have to take into account different alternatives in measurement devices, measuring parameters and measuring intervals. You have to take into consideration different preparation times. I.e. you have to elaborate a timetable with different alternatives. In interpreting your data, you should consider different possibilities of views on the data. The subsequent principles want to help to enlarge the fan of possible interpretations.

a2 *from humanities*:
a2.1 in language use: when you produce a sentence in an utterance, you start with the first word (or the first phrase) and you reach the point where you have to choose the next word. Having chosen, you utter this word and you reach the next point of decision.

a2.2 if you want to communicate something to the hearer about an item under discussion (theme), you have to choose which information could be interesting for the hearer (Rheme). Then you have to build up a sequence of words according to grammar rules. This means that at each point of the hitherto uttered part of the sentence you have a fan of grammatical categories and there within a fan of lexical words, from which you fix one and utter it as the next part of the sentence (cf. Theme-Rheme-Model, 6. principle).

HINTS: If you see that your decision brings you into a direction, which you did not intend, then you go back to the last decision point and take another possibility, if the situation permits you to revise your decision (backtracking). This strategy is especially useful in a labyrinth. (There actually are labyrinths in reality.)

This principle is so basic that it will be used in each of the following contributions without being mentioned further.

2 Principle of Atomism, Holism and Hol-Atomism

IDEA: in the scientific description of a phenomenon under a certain purpose, you have to *decide* between

- a description, which starts with atom-like elements, if you see the phenomenon as a puzzle combined by rules and
- a description which starts with a gestalt, a whole, you have in mind and which has functional parts (called holemes), if you see the phenomenon as a special case of a general whole (Holon, pattern, Gestalt, Type).

2.1 View of atomism

IDEA: For a given phenomenon, we can imagine that it is built up from smaller parts, which are suitable enough to form combinations which can build up various phenomena. Therefore, one constructs a building set and hopes to describe each phenomenon in the field by this building set.

PRINCIPLE: A phenomenon is described as a rule based composition (combination) of a fixed set of smaller objects. Take a fixed set of *atoms* (defined before) and apply a rule from a fixed set of *rules*. Thus, you get a *structure*. Repeat this procedure as often as you need it for your purpose.

DESCRIPTION: If you *choose* the atomistic view, you have to define
- A set of atoms (eventually of different categories or types)
- A set of rules how to combine the atoms respectively the categories.

Then you can build structures, which model the phenomenon under the given purpose.

EXAMPLE:
e1 Daily life:
Children use building blocks (atoms); put one on the other (rule) to construct an object (structure) they have in mind. There are different trade names with correspondent products for children.

e2 Any game is build up in this way:
Atoms: playing cards or figures (chessmen),
Rules: rules of the play and dice
Structure: playing status.

e3 Cooking recipe: the list of ingredients in the kitchen can be seen as atoms for various dishes.

e4 fortune telling uses atomistic device (playing cards or other combinable elements)
or gestalt device (liquid lead figures or coffie grounds or the Roman auspices). The prediction is not inherent in the structures, but comes in by interpretation of the structures.

APPLICATION:
a1 *Mathematics*: Set theory gives the fundament for of precise atomistic theories. In the Bourbaki programm many theories of mathematics are reformulated already on the basis of set theory.

a2 *Physics and Chemistry*:
a2.1 *Elementary particles (nuclides)*
Together with binding conditions
Build up physical atoms
Atoms: elementary particles (nuclides, quarks etc.)
Rules: binding conditions
Structure: physical atoms

a2.2 *Physical atoms* under chemical binding conditions build up chemical substances i.e.
Atoms: physical atoms

Rules: chemical binding conditions
Structure: chemical elements

a2.3 *Chemical elements* under chemical reaction conditions build up a chemical compound i.e.
Atoms: chemical elements
Rules: chemical reaction conditions
Structure: chemical compound
From this iterative composition process, you can see that "atom" and "structure" can be seen as hierarchy, in which a structure in one system plays the role of atom in the next higher level. The same is valid for linguistics.

a3 In *Linguistics:*
a3.1 Atoms*: letters*
Rules: word-forming rules
Structure: a word.

a3.2 Atoms *of different categories*: words classified as substance, verb, etc.
Rule system: the grammar
Structure: sentence.

a3.3 Atoms*: Sentences*
Rule system: the "text grammar"
Structure: texts

HINTS: this principle is relevant for the methods ASPECTEX and RELATEX
LIT: Mudersbach 1983, 1991, 1997, 1999
TRA: Sunwoo, Will.

2.2 View of holism

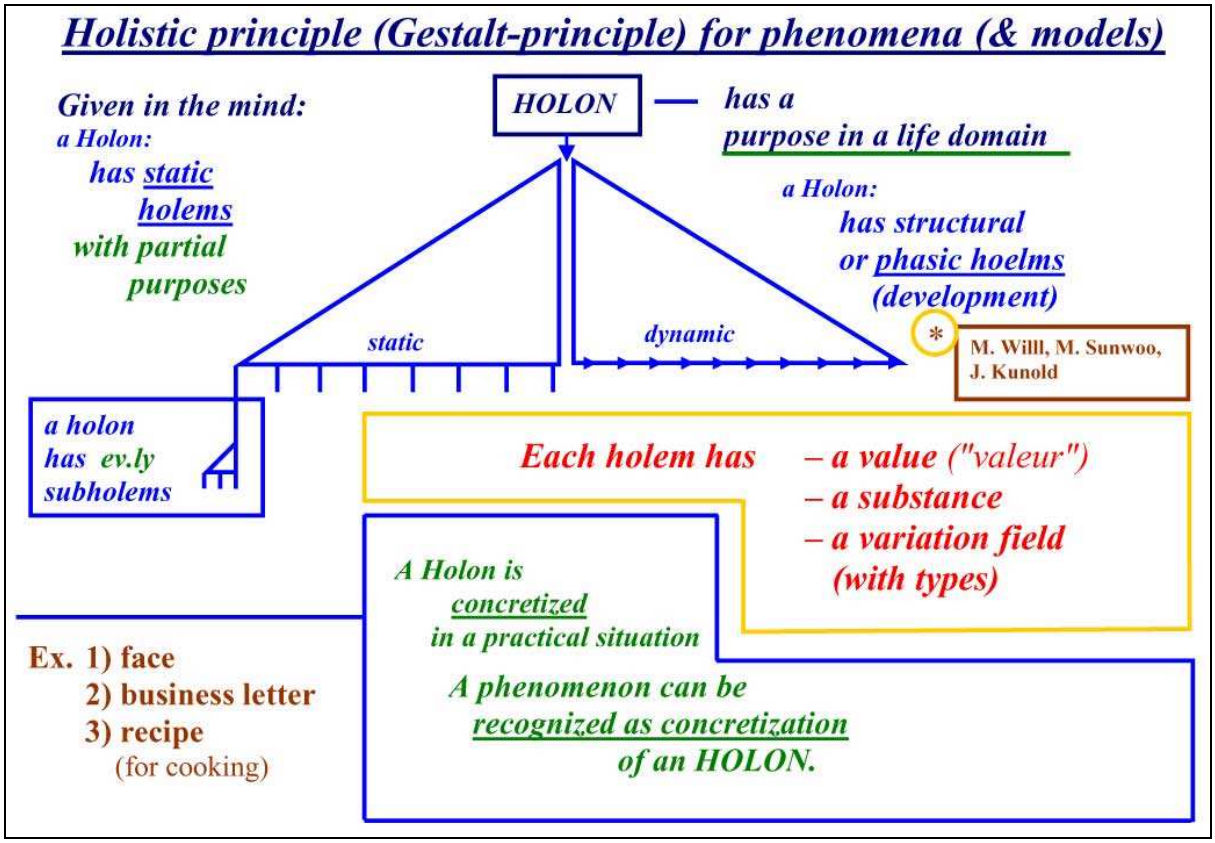

Fig. 1: Holistic principle

IDEA: If you recognize in a phenomenon a "gestalt" you are acquainted with, then you can reconstruct or model the phenomenon with all its parts as a concretization of this gestalt. Other words for *gestalt* are *whole* and the Greek expression: *Holon*. The holon fulfills a certain given *purpose* in the considered field of phenomena.

PRINCIPLE: A phenomenon is described as a complete holon with its *necessary parts* (holemes). The holon is an abstract structure in the mind of the user. It serves a certain purpose in a life domain.

DESCRIPTION (see fig. 1): The holon has parts. We call them *holemes*. A holeme fulfils a "partial purpose", i.e. it is part of the general purpose of the whole holon.
There are two *types* of holemes:

- Static holemes (independent of time)
- Dynamic holemes called "phases", which form a sequence of events or actions in time.

The static holemes give the ingredients, the basic "objects" (as object-roles).

- The *phases* form a sequence of events or actions which lead to the fulfillment of the intended aim of the holon.

Each holeme has four components:

h1 The *value* (the non interchangeable specific position point in the holon) expressed by a name,

h2 The *purpose* (or function or role) of the holeme in the holon

h3 The *substance type* indication: e.g. persons object, abstracts.

h4 The imaginable *variation field*, possibly with subfields
which are "typical for" a certain aspect.

A holeme can have "subholemes" (which then have four components as well).
A holon is the sequence of all static and dynamical holemes together with their *interrelations*.

The four components of the holon are built up from the respective corresponding components of the holemes. The *purpose* of the holon is determined by the life domain, in which it plays its function or role.

A holon is an abstract structure in the mind of the user with two possible applications: *concretization* and *recognition*.

A *concretization* starts with the abstract holon and builds up a material exemplar of the holon as phenomenon. A holon is *concretized* in a practical situation by a special choice from the variation field.

Recognition starts with a phenomenon and by intuition the observer, "sees" realized the structure of some holon in the phenomenon. I.e. A phenomenon can be *recognized* as a concretization of an holon, if the recognizing person has the holon already in his mind. From a phenomenon, one cannot discover or construct the holon; one must "add" it from prior knowledge (Immanuel Kant has discovered this solution to the cognition problem. He has called it his "Copernican turn" in the theory of knowledge)).

General operations with holons

g1 *Concretization of a holon*: If you see a face in the profile, you see only one eye and one ear. However, from your face holon in your mind you *recognize* it tentatively as a face. Therefore, you *add* the lacking holistic information (cf.a3.1).

g2 *Recognition of an holon*: On the other hand, if you have to draw a picture of a face in profile in *concretizing* your face holon, you *subtract* some part of your holistic knowledge (cf.a3.2). These are general mental operations man uses in daily life, science and humanities.

g3 *Switch phenomenon*: you all know the picture of a young woman, which suddenly switches to an old woman or the duck-rabbit- switch picture of the Tractatus of L Wittgenstein. In both cases, it depends on your holistic gestalt you prefer to see. It is a holistic *recognition problem* because the picture corroborates both gestalts with different function of the parts.

g4 *Judgment on the quality of the concretization* of the holon: Since it depends on your choice of holon, you can give different evaluations on the same phenomenon (referring to the switch design mentions above): as an old woman she looks embittered, as a young woman she looks charming.

EXAMPLE: from daily life:

e1 *Cooking recipe*: with the specific ingredients (as static holemes) and the preparation procedure (as the dynamical holemes, the phases)

e2 *Face recognition or design*:
Holon: Face.
Purpose: concentration of the human sense device in one part of the body.
Holemes: eyes, nose, mouth, ears.
Their partial purposes: the different sense devices.
Take as example of a holeme the nose:

Value: "nose"
Purpose: to smell.
Substance type: cartilage, bone, skin etc.
Variation field: The form of the nose (of the nose bridge) can vary within a certain *variation field*. *Typical forms* are: snub nose, Greek nose, hooknose (or aquiline nose), etc.
The nose has subholemes: bridge, two sides, 2 nostrils, a column, a tip.
They are interrelated in a certain way describable by the relators: *below of*, *on the side of*, *in front of* etc. -

e3 A *business letter* has a holistic gestalt. Before you start to write, you have to know the parts (holemes) and where the parts have to be placed on the sheet.

APPLICATION:

a1 natural science:

a1.1 Periodical system in chemistry: the system of Mendeleyev can be considered as a holon, where each chemical element has its place.

a1.2 In biology a cell is a holon with functional parts (holemes). The cell as a whole has a function in some bigger compound like an organ. An organ is a holon as well with functional parts (which are not the cells but compounds of cells). An organ has a function in some bigger compound like an organism or an animal.

a2 humanities:

a2.1 F. de Saussure has conceived Language as a holistic system where every part stands in relation to every other part. This is expressed by his concept of "valeur", the value (or role or function) of its "position" in the system.

a2.2 At the beginning of the 20th century in psychology after an atomistic period there came the period of Gestalt psychology. However, they concentrated mainly on the phenomenological aspects: they did not formulate a structured formal theory of gestalt. Nor did any other theory in linguistics or logic this task.

a3 General operations
The two above-mentioned operations of holistic *adding* and *subtracting* information are important as well in the knowledge theory of I. Kant. From the holistic considerations here, we can conclude:

a3.1 *In a recognition act* one has to add information from the mental representation of the

supposed holon. E.g. a real three-dimensional object is never seen by the retina in all parts at the same time. One has only one perspective of the objects. The rest one has to complete from the holistic representation of the whole object in the mind.

a3.2 *In a production act sometimes one has to subtract* information from the mental representation of the intended holon, *e.g.*

- if a child designs a house, it designs it with all its four walls, because the child "knows" that the house has four walls, but it does not yet know that it has to subtract at least two walls.

- or: The adult author of a *text* does not describes all parts of the object; he mentions only those parts, which are interesting for the communication.

- or: in the *communication through language*: the author omits all holistic information, which he thinks the reader can add from his knowledge base. Clearly, this works only on the common base in knowledge. Without doubt one function of culture is: to guarantee this common knowledge in everyday life for the members of the community. As well, one function of science is to give a common holistic knowledge base for the scientific discourse to facilitate the communication between experts in the field.

I baptize these two mental activities (g1. a3.1 and a3.2) in honor of I. KANT:
"to kantize" (g1., a3.1) and "to dekantize" (g2.,a3.2)
with the meaning of:
<"to dekantize">: The author of a holistic description leaves out any part, which he believes that:
<"to dekantize">: the receiver of the description can make the completion straightforward from his own holistic knowledge.

HINTS: cf. 13. principle: holistic logic.

LIT: Mudersbach 1983a, 1983b, 1991, 1996, 1997, 1998, 1999a, 1999b, 2001, 2004a.
REF: Gerzymisch-Arbogast/Mudersbach 1998, 1999, 2008. .Saussure 1967,
TRA: Gerzymisch-Arbogast, Will, Sunwoo, Kunold.

2.3 View of hol-atomism

The holistic and the atomistic view stand in clear opposition to each other.

I think, reality lies in between. Therefore, we need *as well* a description, which lies in between. My proposal is a bridge between the two perspectives: if you reconstruct a holon as a network, in which each holeme stands in relation to all holemes in its neighborhood, then one can see the starting holeme h.0 as an atom. And the first neighborhood which contains the relations to all other directly attainable holemes as "the first hol-atomistic level". You get the second hol-atomistic level, if you build the neighborhood for each holeme of the 1. neighborhood and put them together as the second neighborhood of the starting holeme h.0.

With such a construction, you can go on in the network until you have covered the whole network as the maximal neighborhood level. This is the holon, which you can attain from the starting holeme h.0. -

As well you can start from the holon and concentrate your attention on a smaller neighborhood, until you attain the final "atom" in its centre. Any level between the maximum level and the minimum level I call a "hol-atomistic level" (of the degree n). Reality could be

described on such an hol-atomistic level. The level number is defined by the stepwise incremental definition above. Which level degree corresponds to an actual reality section, depends on the differentiation of the concepts in the description. The same is valid for a discussion, in which different interlocutors use a concept with different specificity of meaning. Here one can contrast the different hol-atomistic levels of the participants.

HINTS:
LIT: Mudersbach 1983a, 1983b, 1994,
REF: Mudersbach 1988, 1990, 1991,
TRA: Dejica.

2.4 Comparison of advantages and disadvantages of atomistic and holistic descriptions

2.4.1.a: In *atomism*: you miss the wood (holon) for the trees (atoms). It means: there is no final structure which satisfy a gestalt criterion.
2.4.1.h: In *holism*: you miss the trees (atoms) for the wood (holon). It means: there is no initial structure with which you can start to see the gestalt.

2.4.2.a: Atoms offer a flexible tool for different purposes.
2.4.2.h: A holon is an adequate tool for exactly one purpose ("tailored to measure").

2.4.3.a: Atomism emphasizes the starting point (in logic: the premises).
2.4.3.h: Holism emphasizes the aim (teleological considerations).

There is a saying about holism which is a bit too simple: "The Whole is more than the sum of the parts". even an atomistic structure is more than the addition of all the atoms in it, because there can be different structures with the same sum of atoms. What is "more" in an holistic "structure than in an atomistic structure? In a holistic structure, each part has a unique function in the whole and the function of the part is determined by the purpose of the Whole. Therefore a holeme indicates its specific whole (cf. 13: holistic logic); an atom has no such function.

3 The ICS-Principle (individual, collective, system level)

IDEA: If you see a bird flight, you can try to fix an individual bird and follow its movements or you can look at the whole quantity of birds collectively and follow the collective movement. Or you can think of the collective as a unity (the bird flight) leaving out the particular birds. This is the system- or macro-level. The others are the individual- (or micro-) level and the collective level. Therefore we can look at a phenomenon from 3 points of view:

- either we look at the individual event with its individual properties,
- or we gather many events in a collective and look at "common" statistical properties,
- or we look at it on a system level studying only the properties themselves and the relations between them.

PRINCIPLE: a phenomenon can be seen and described in three levels:
The individual, the collective and the systematic level. (therefore: I-C-S-principle). Under certain conditions one can change from the individual level to the collective and to the system

level under . The way from the system level to collective level or to the individual level is fallacious, if one does not pay attention to precautionary measures (cf. Storrer 1992, Gerzymisch-Arbogast 1996).

DESCRIPTION: The principle has three levels:

1. *Individual level*: one observes an individual object or phenomenon and determines its individual properties under some parameters.

2. *Collective level:* we look at a set of objects, which have a property P in common (the collective of P-objects) and we are interested in the distribution of some other properties in this set of objects. We use statistical counting for the determination of the frequency of these properties. We can form from the statistics with more than one parameter correlations and factorial analysis.

3. *System level:* we look at the property P in relation to some other property Q and we try to formulate a law for this relation: either a statistical one or we can *induce* from this a deterministic law for the mean values.

The transition between system level and individual level can be seen under the terms TYPE and TOKEN. Once you have abstracted from individual objects some typical qualitative on the system level you create a Type for this object category. Individual objects can be seen as Token of this Type. A Token must have all the qualities of the Type and in addition some individual and collective qualities. the individual qualities distinguish the individual object strictly from any other. they form its identity criteria. the collective qualities are those many tokens of the same type have in common (without being Type qualities).

EXAMPLE:
If you have a car, it is a car of a certain Type (defined by the project of the constructor of the car in the system level). Your car is a Token of this type, and it has some individual qualities (identifying qualities: e.g. the car number and idiosyncratic qualities: the clutch is defect). If you go to the workshop the boss consoles you with "most cars of thy Type have this defect!" - Therefore your clutch defect is non purely individual, but as well collective.

APPLICATION:
a1 *Physics*: in the kinetic theory of gas you can look at a gas as macro object with macro properties as volume, temperature and pressure (*system level*).

Alternatively, you imagine the particular molecules (the micro objects) and their properties like impulse and energy and length of path (*individual level*). On the *collective level*, you look at the distributions of these parameters in the gas seen as collective ob micro-objects. By statistical procedures, you can extract from the distributions the mean values of the micro parameters and look for the correspondence to the parameters in the macro level.

a2 *Sociology*: you can make statistics on the number of children in a say German family. Therefore, the criterion parameter P for being a member of the collective is *German family*. Then you take as parameter to study Q:= number of children. By statistics on your empirical sample, you extract: the German family has 0,83 children. From this value, you see that the macro-object "the German family" cannot coincide with a real one. So your macro units on the system level must be described in a macro language, which may differ from the language for the micro level. And this means that you must pay attention when you use a term like *German family* because it has three different meanings and three different logical properties.

a3 The meaning of a word in a particular text is different from the meaning of a statistical research on meanings in texts and different from the system meaning given in a dictionary. Transitions between these levels in argumentations have to be looked at carefully to avoid fallacies of not allowed transitions between the levels.

HINTS:
LIT: Mudersbach 1997, 1999. On the fallacious transitions between the ICS levels:
Storrer 1992, Gerzymisch-Arbogast 1996,
TRA: Gerzymisch-Arbogast, Floros.

4 Principle of Kommunikant Views

IDEA:
Since speakers have individual opinions and individual word-meanings, a dialog can lead to misunderstandings in information and in language use. Therefore, one should take into account each speaker separately with his view on the world and on his language. So one has to distinguish the differences in language use and in the different views of speaker and hearer and other participants in a situation.

I use the word kommunikant (with "k") for the model of a language user with his own individual point of view on information, language and laws.

PRINCIPLE:
All what we think and do, we do within our own point of view (i.e. with individual beliefs). We cannot know the point of view of somebody else, say A, in an objective manner. We only have our hypothesis about his point of view (which is in our point of view) and vice versa. We can have as well iterated views: my view about your view about his view etc.

DESCRIPTION:
The point of view of a kommunikant K is abbreviated by "/K", the *kommunikant index*. (We propose this abbreviation.).

- The point of view of another person A is /A (= A's view as seen in K's view).
- The view of K of the view of A is /A/K, (i.e. K's hypothesis about the view of A). And similar higher hypotheses as for example /K/A/K etc.

The point of view of K concerns the *kommunikant basis* KB(K) of K (cf. fig. 2):

- The information state of K: INF/K (containing the information on the world of K)
- The concepts of K: CNC/K (the meaning of the words in the language of K)
- The lexical units of K: LNG/K (special uses in his language)
- The laws of K: LAW/K (laws and rules believed by K, independent of being objective or subjective). The laws contain as well the logical laws of the different belief systems INF/K, CNC/K, LNG/K The logical laws are common to all communicants; but there may be differences in the activation mode (cf. 12. principle: logical inference).

The language of K and the language of A should not be seen as different natural languages but small individual lexical differences in one natural language, but K and A do not know where these differences may occur (cf. 5. Principle: Uttereance Model of language).

EXAMPLE:
e1 *Dialogue* between K and A:

- K utters to A the sentence: utt1/K.
- A understands from utt1/K in his view utt1/K/A and reacts with utt2/A (or with utt2/K/A,

if he tries to speak to his hypothesis about K)

- K understands from utt2/A in his view utt2/A/K

(or from utt2/K/A: utt2/K/A/K, i.e. K understands what he believes that A did answer to what A believed that K has said.).

The speaker must have a hypothesis about the individual idiom of the hearer, before he can start to form his utterance. In this hypothesis, there is a large overlap between his own idiom and the idiom of the hearer, but the speaker never knows at which part of his idiom there occurs a difference, which leads to a misunderstanding or to a difference in opinion. These phenomena can be modeled by the use of the kommunikant indices. (cf. Mudersbach 1984, 1987, 1989, 1997, 1999)

e2 *Observer vs. Participants:* A situation SIT with 2 participants K and A is observed by an observing kommunikant B. So we have 3 different views on the SIT: SIT/K, SIT/A, and SIT/B.

But B has as well his view about what K believes about SIT: SIT/K/B and similar for SIT/A/B. Since B is observer, he is not "seen" by K and A, because B does not interact with K and A. So K and A have no hypothesis on B.

If K has a belief about how A sees the situation SIT: we have as well: SIT/A/K and SIT/K/A. The observer then has in his view: SIT/A/K/B and SIT/K/A/B.

If one tries to formulate these various views in common language, it will become cumbersome. The kommunikant indices simplify the access. Anyhow, these views are imaginable. And often they are needed to explain the misunderstandings happening between the participants as seen from the observer B. When the misunderstanding is clarified, both participants can compare their hitherto wrong views with the actual correct views.

APPLICATION:

Application 1: The kommunikant indices are useful with intentional beings. In natural sciences where the role of the intentional being is only that of an observer of non-intentional objects and phenomena, his intentions and hypothesis are not reflected by these entities. Therefore, only the communication between the scientists has this intentional dimension and that is the task of the kommunikant indices. Communication about the interpretation of the phenomena is an important part.

If two observers have differing theories about the same phenomenon, the two theories can differ only in some details or they use different ingredients (perhaps with the same name!). In this case they are non commensurable. E.g. the concept *mass* in classical particle mechanics (CPM) is different from the concept of *mass* in special relativity theory SRT /CPM: mass/CPM =/= mass/SRT.

Application 2: If you are spectator in a theater play of the type comedy of errors, you see 2 persons K and A speaking about the "same" person P, but in reality there are 2 persons P1 and P2. And while K speaks about P1, A speaks about P2. But both believe that they speak about P. Only the spectator B knows this on the base of more information. But as observer he cannot intervene, only have its fun with the misunderstandings on stage.

Application 3: if you interpret a philosophical or a literary work LIW written by an author A, you give your view on LIW: LIW/K and you try to interpret (and criticize) the view of A: LIW/A. But since you never can know the real view of A, you have only a hypothesis about LIW/A: I.e. LIW/A/K. - If you interact with A, he can (mis)understand your hypothesis LIW/A/K as LIW/A/K/A, and you notice this in your view as LIW/A/K/A/K.

If one does not distinguish these various views on each other, one cannot understand, why such a discussion is going into a complex thicket.

HINTS:
LIT: Mudersbach 1984, 1994,1997, 1999,
REF: Mudersbach 1987, 1988, 1989, 1992, 2004a.
TRA: Sunwoo.

5 Utterance Model of language (hexagon model of language use)

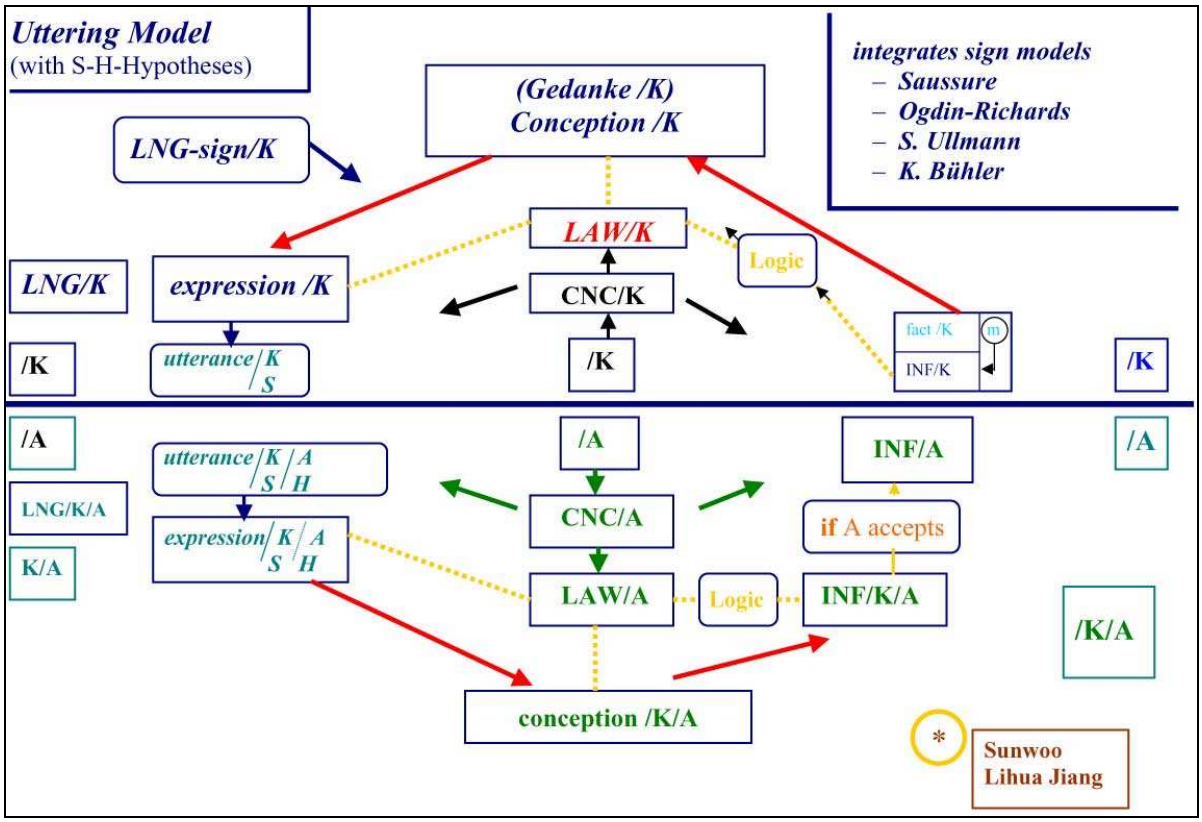

Fig. 2: Utterance model of language (hexagon model of language use)

IDEA: How can one describe the process of speaking and hearing in a dialog, if one presupposes that both kommunikants have their own idiomatic language characteristics? In this case, one has to consider the change between the idioms when the hearer hears the utterance of the speaker in the speaker's idiom and tries to understand it within his own idiom. All traditional models for language signs as systematic units ignore these differences between speaker and hearer idiom. (Saussure, Ogden-Richards, et.al.). They presuppose one natural language for both in the triangel model of language signs. So semantic misunderstandings cannot be described.

On the other side, there is a model, which takes into account the speaker and the hearer of an utterance: the organon model by K Bühler that has other shortcomings But it does not take into account idiomatic (idiosyncratic) differences in the meaning, but describes only the transition from the speaker to the hearer with the help of the language sign. (cf. Hint).
I try to combine the good parts of the different models and propose *a 6-angle model*, which combines a triangle for the speaker's utterance of language signs with a triangle for the hearer's understanding the utterance of language signs.

PRINCIPLE: The speaker K wants to communicate information to the hearer A. He first forms a conceptualization in his idiomatic meanings and then verbalizes them in his idiom. The hearer on the other hand starts with this utterance interpreted in the hearer's hypothesis on the idiom of the speaker, and then he adds the information extracted from the reference of the word meanings and records it in his hypothesis about the information state of the speaker. If he accepts the message, he can "translate" it into his own language and add new information to his own information state.

DESCRIPTION (see fig. 2):

1. The speaker K chooses a fact FC from his information-state INF/K.
2. K forms from the fact a thought TH/K, i.e. a mental representation, on the base of concepts from the set of concepts CNC/K.
3. K expresses the thought TH/K in his lexical units LNG/K as a sentence SE/K

3.1 K utters this sentence as the *utterance towards* a hearer A: UTT/K,

4. The hearer A receives the utterance UTT/K and understands it in his view as UTT/K/A.
5. A then has two possibilities:

5.1 either he interprets the utterance on the base of his own language system and gets the thought expressed in UTT/K/A as TH/A. Then he maps the thought on his information state INF/A.

5.2 or A interprets the utterance on the base of his hypothesis of the K-lexemes LNG/K/A as TH/K/A.

6. In this case he tries to imagine what the speaker K conceived as a fact FC: i.e. FC/K/A. A builds up a whole information state of K: INF/K/A.
7. Then the hearer decides,

7.1 if he accepts the fact as seen by K (FC/K/A) in his own information state INF/A as FC/A.

7.2 or A refutes FC/K/A and remains with his own different view of the fact.

This model has six angles instead of three, because the hearer goes back the same way that the speaker has gone before, but in his hypothesis on the speaker.

In short: in the view of /K

FC/K ---> CNC/K ---> UTT/K

In the view of /K/A:

UTT/K/A ---> CNC/K/A ---> UTT(/K)/A.

Or translated and accepted in his own idiom and information as

UTT/A ---> CNC/A ---> FC/A.

The Set of Concepts CNC/K and the set of laws LAW/K between the concepts are an addition to the 3-angle-model for the speaker K and for the hearer A.
Remark: In the special version used here, the Concepts are the basis of
a) the language, b) the meaning laws and c) the information about the world.
They are different in the speaker part and in the hearer part of the model.

APPLICATION:

a1 *In natural science*, we have languages for special purposes with unambiguous technical terms. They seem to be rule based in such a way to guarantee a uniform use for speaker and hearer. However, in reality you have slight differences in the meaning, if a term is used in a technical text or in the definition on the system level. (cf. Gerzymisch-Arbogast 1996). We can find out this contextual meaning only, if we use a special method, which is sensitive to textual meanings without reducing it to the lexical system meaning (cf. 5. the ICS Principle). This method is RELATEX (cf. Mudersbach 1991, Gerzymisch-Arbogast, Mudersbach 1998).

a2 In *philosophical texts*: the meaning depends in a much higher degree on the authors use and on his special use in context. If a reader interprets a term with the system meaning , it will come out a misunderstanding. Hermeneutics is the science of studying individual author specific meanings (as seen in the hypothesis of the reader). In this field, Relatex can help at least to establish the findings and the diagnosis on the individuality of the context sensitive meanings.

HINTS: a short remark on the above mentioned organon model of K Bühler because it could be seen as an alternative to the -triangle model given here. the organon model was inspired by Platons dialog Kratylos using his sentence: "Somebody (the speaker K) communicates something (Z) about an object (G) to somebody (the hearer A)." However, Bühler did not translate this sentence exactly into his organon model. The model Bühler proposed contained only: the speaker K, the hearer A, the sign Z and the object G. He omitted the relation between these four entities, which in Platon is "to communicate". - Instead of one 4-place relation, Bühler conceived 3 different 1-place-relations:
The relation between K and Z,
The relation between Z and A, and
The relation between Z and G. -
But here is no condition which brings this 3 relations together in the way, in which the 4-place relation "communicate" binds together the 4 arguments: K,A, G and Z in Kratylos.
Another interpretation of the organon model could be: Bühler uses the sign Z as relation with 3 argument places: K, A, G. But in this case the relation Z cannot be at the same moment the language sign Z meaning G.
Therefore the model of Bühler is a misunderstanding or wrong interpretation of the Model of Platon.

LIT: Mudersbach 1984, 1998, Saussure 1967, Ogden, Richards 1923, Bühler 1934.
for RELATEX: Mudersbach 1991, Gerzymisch-Arbogast, Mudersbach 1998.
REF: Mudersbach 1987, 1989**,** 1994, 2002**,**
TRA: Sunwoo**.**

6 Theme Rheme Model (cf. fig. 3)

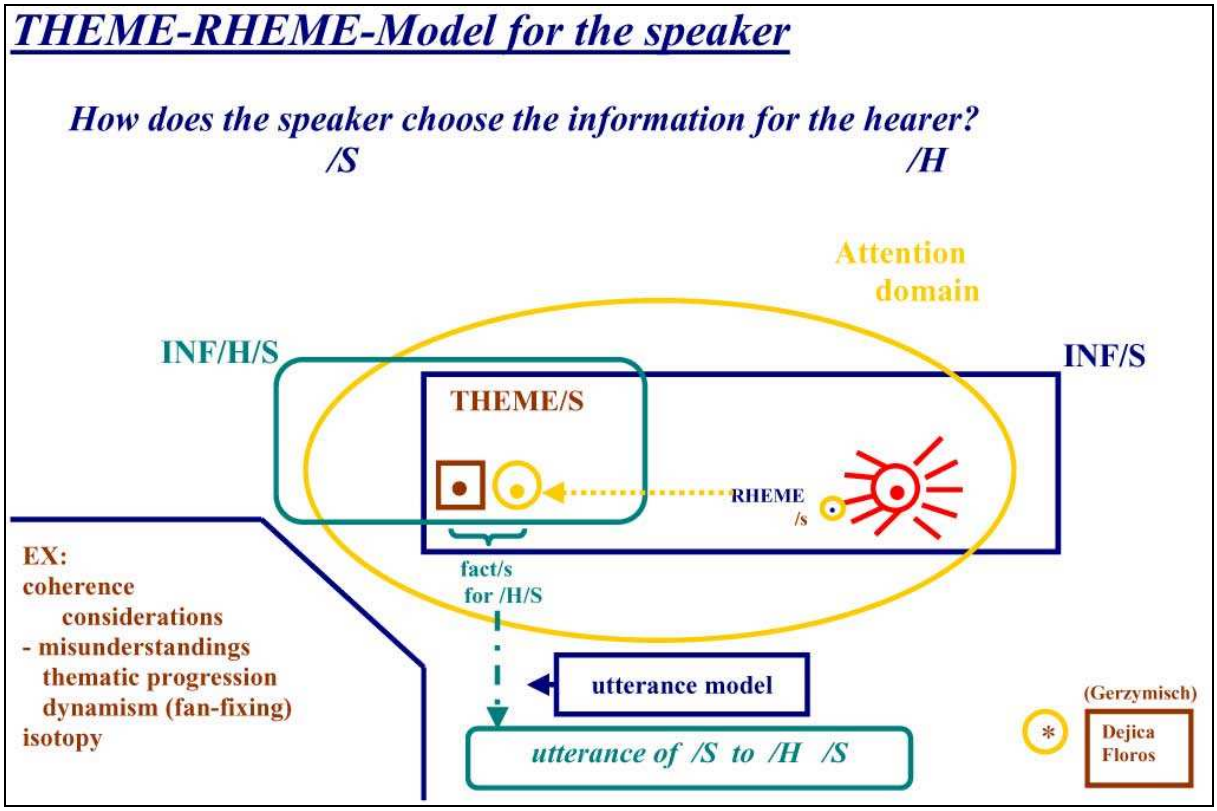

Fig. 3: Theme-rheme-model for the speaker

IDEA: the question is: how does the speaker choose interesting information for the hearer? The speaker has to consider his hypothesis about the hearer's information state and about what could be of interest for the hearer.

PRINCIPLE: The speaker S and the hearer H have an *attention domain* in common. Within this domain, the speaker is concentrated on a *theme*, which he wants to treat with the hearer

- either because the hearer has asked
- or because the speaker wants to communicate something interesting to the hearer.

The theme stems from the common part of the information state of speaker and hearer. The rheme stems from the non-common part of interest, i.e..the part that the speaker knows, but the hearer does not know. .

DESCRIPTION (cf. fig. 3):
Given the intersection of the information state INF/S with INF/H/S, S chooses information from that part of INF/S, which has to do with the theme and which he believes is not known to the hearer H. This information part is the *rheme* of S. The speaker fixes the combination of theme/S and rheme/S and produces the utterance of this combination of information according to the *6-dimensional* utterance model. The hearer checks, if the rheme is new to him and then decides, if he wants to integrate it into his information state.

EXAMPLE:
In every day dialogs, each sentence in a sequence of sentences show this pair: theme and rheme. It is an indication for coherence, because the hearer can find the thread of the story if he puts the theme rheme sequences together.

It will be irritating for the hearer if the speaker starts with the rheme. For example: After a radio transmission the speaker says: "0613844... ----- This is our telephone number, where you can order an audio cassette of the transmission. "
Here you hear at first a number without any relation to a previous theme, but which afterwards is the rheme for the theme which follows.

APPLICATION: one can use this model in any scientific and non- scientific text for the following considerations

- Coherence control (Mudersbach 2008b),
- Resolution of misunderstandings (Mudersbach 1987),
- Development of a theme in a text (thematic progression)(Danes 1970)),
- Development of information specification along a sentence according to the fan fixing model (cf. 1. principle),
- Isotopy lines in a text (Mudersbach & Gerzymisch-Arbogast 1989).

HINTS:
LIT: Mudersbach 1981, Gerzymisch-Arbogast 1987.
REF: TRA: Dejica, Floros, Sunwoo.

7 Sense-giving model (cf. fig. 4)

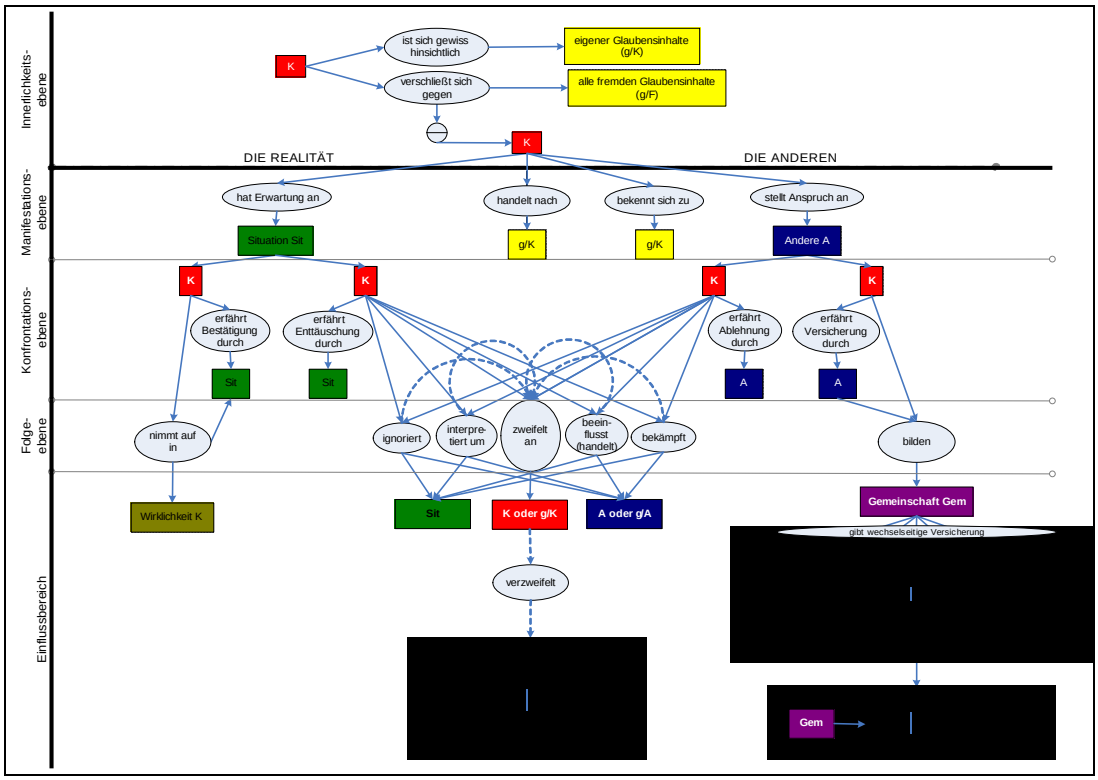

Fig. 4: Sense giving model

IDEA: how can one explain the behavior of a person who has found a conviction, which he holds with certainty? Are there indications of the seriousness of his conviction? I started to think on these questions after reading Kierkegaard. He said that a person must grasp (appropriate to himself) a conviction with his *interiority* to become an existential truth for him. I use the concept "interiority" for both: for momentary beliefs (emotions) and permanent beliefs (convictions)

(As for the notation: The numbers in "principle" correspond with the numbers in the description part.)

PRINCIPLE (cf. fig. 4):

1. A person K with a firm belief or faith (in his interiority)
2. *manifests* his belief B in 5 ways:
   - He *acts* according to B
   - He *confesses* his belief if requested
   - He *refutes* any other belief different from B
   - He *wants* another person to believe B as well and
   - He *expects* that certain situations develop according toB.
   - He *claims* from himself self-coherence and firmness in coherence with B.
3. K is *confronted* then with the reaction from the outside.
4. K draws the *consequences from the reactions*
5. Or: by the reactions K is influenced in his firmness in B: he begins to doubt and to despair. This can lead to a new belief.
6. The behavior of more than one person with the same belief, i.e. of a *community*, is more or less the same as an individual person.
7. The community installs an *institution* to control the wholeheartedness of the members. The institution then has its own development.
8. The institutionalization of the belief affects the intensity of the community-belief. The members become inattentive and lazy.

EXAMPLE:

Phenomena of individual belief are: emotions, convictions, superstitious beliefs; individual works of art, individual pilgrimage, individual campaigns.

Phenomena of group beliefs: parties, associations, common manifests, group language, in group speech, emblems, symbols, traditional forms of behavior and social events.

Phenomena of community belief: the common language, the statutes of an association, the constitution of a political community, the laws, the common religion (churches), the common (socio-) culture, schools, universities, the arts and traditions, memorials, monuments.

Common events are commemoration days, holidays, sports meetings and championships, matches, contests, conferences, mass confessions, demonstrations for the common conviction or against the conviction of another group..

One can distinguish

- Particular applications to individual cases of belief: e.g. to all phenomena in every day life and in science where the relation between an intentional being and a belief with certainty (convictions or emotions) is involved.
- General applications to other principles or models: e.g., the language use model can be enriched by the Sense-Giving Model. Each of the six angles of the model can be impregnated with emotional or permanent inner participation (interiority). We say that something is "sacred" (or "holy") to us meaning that we are involved by an inner emotional commitment with this item. According to the language use model this concerns: objects, books (e.g. The Holy Bible), facts, concepts, space domains, time domains, laws or rules, (magic) words or (magic) sentences, person (e.g. saints, gurus, etc.), actions (liturgy), traditions etc. The fact, that all such sacred or holy entities can be constant precious parts of any *culture* whatsoever, shows the universality of the sense-

giving model.

One can see this interiority in the reaction, when somebody commits a sacrilege against a sacred entity in the social or individual culture. He will be persecuted and severely punished, if captured.

As well the principles discussed here can have parts which are impregnated with the interiority of a person or a community.

APPLICATION:
In theory of science: T.S. Kuhn has introduced the term "paradigm" to characterize a whole school of thinking in a science field. A paradigm is a specific conviction (belief). The members of the community defending this conviction see all phenomena with their colored glasses: they treat the empirical problems within the language and theory of their paradigm. The fight between paradigms and the "change", better the rupture (revolution) from one paradigm to the next, as T.S. Kuhn describes it, can be embedded as special case in the Sense-Giving Model.

Natural science: a theory has to be defended at the beginning by the "new" scientists as if this would be a personal belief because the community of the old paradigm does not allow any deviation. A famous example quoted by K. Jaspers is the belief of Giordano Bruno and the belief of G. Galilei. Both believed that the earth moves around the sun. Bruno could only *confess* it as his own belief or faith (and he died for that on the pyre), Galilei had empirical arguments for it and could save his life, but only abjuring under the pressure of the Catholic Church.

Many other cases could be quoted here, where a researcher has found some new knowledge, but was not recognized by the established community of science (G. Mendel, I. Semmelweis, F. Doppler, G. Frege, G. Cantor etc.).

Humanities: *History* shows the developments and interactions of communities under various constellations of beliefs: They take place between alliance and conflicts, including wars.
The works of Art show "frozen interiority". they have to be "defrosted" in the microwave of a heart in interior resonance.

Translation: the inner constellations between the author and the reader of a text play an important role in the intensity of acceptance, interpretation and adaptation. Translation has to confront these inner constellations.

Philosophy: the sequence of philosophical currents in history and the polemics between them are ongoing examples of the Sense-Giving Model.

Religion: Myths are offers for convictions where science can give no answer (so far). Religious rituals are often repetitions of mythic contents and events in determined holy times and spaces.

The prophets in the Bible have the steady belief to report the will of God.
The firm faith of Martin Luther is expressed in his saying: "here I am and cannot speak differently" ("Hier steh' ich und kann nicht anders!").

HINTS:
LIT: Mudersbach 1998, 2001, 2004
REF: Kierkegaard 1976.
TRA: Floros, Sunwoo.

8 Action model (see fig. 5)

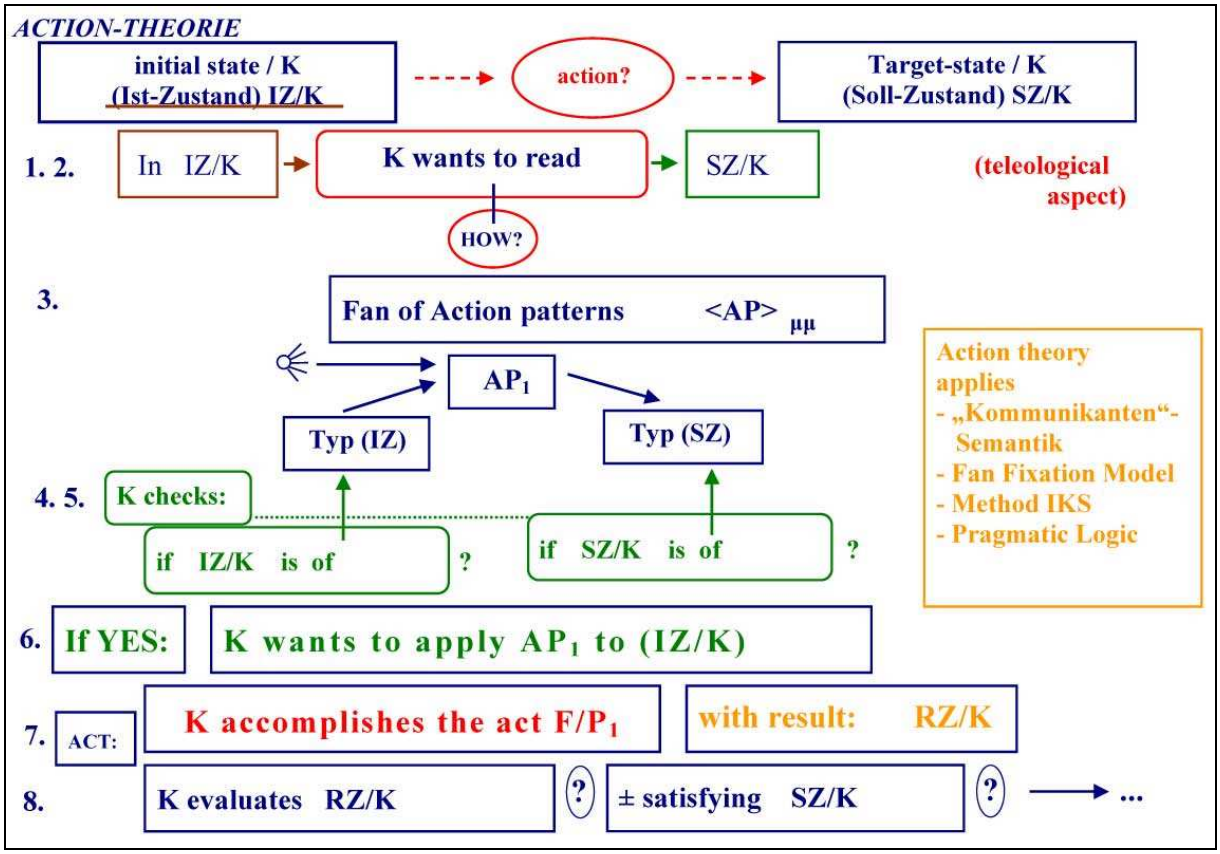

Fig. 5: Action model

IDEA: is there a general model, which describes how we act? How can actions be described in a most general way so that *thinking acts* as well as *real acts* as well as *speech acts* are subsumable?

The idea is the following: a person K thinks on the possibilities to act in a given situation (*initial state*, IZ/K, in German: Ist-Zustand). Then K decides to perform an action according to a chosen *action pattern* to attain a desired situation (target state SZ/K, in German: Soll-Zustand). If the action succeeds, it brings him to the target state; otherwise, K has to decide what else to do.

PRINCIPLE: If K is a rational person with the purpose to attain a certain desired target state, K chooses an appropriate action pattern from his knowledge and accomplishes the action according to the pattern. Then he evaluates the outcome.

DESCRIPTION (see fig. 5):
The acting process is a holon and has 8 phases:

a1 In an *initial state* IZ/K K wants to attain a desired *target-state* SZ/K (Purpose of K).

a2 K opens a fan of action patterns which are suitable more or less to <IZ/K, SZ/K>.
An *action pattern* has the form:
If in a beginning *state BS*, you do the action AC (designated for attaining the *ending state* ES), then you attain the ending state.
Remark: We have to distinguish here between the states in the actual situation of K, : initial state IZ/K and target state SZ/K, and the states in the pattern or action law: *beginning state BS*

and ending state ES.

a3 K fixes one of the possible action patterns, say AP/K

a4 K controls if the *beginning state BS* in the action pattern AP/K fits the *initial state* IZ/K of K.
If in a4. the pattern does not fit, there is a discrepancy between the initial state IZ/K and the beginning state BS. - If K insists on the use of this pattern, K has to find another action pattern that takes him from his initial state IZ/K to the beginning state BS in the action pattern. I.e. K has to start again with a1. (With IZ/K unchanged and with SZ/K::= BS) and follow the sequence of phases until a8. After having accomplished the interlude, he returns to a5 below.

a5 In the same way K controls if the *ending state ES* in the action principle fits the desired target state SZ/K of K.
If in a5. the pattern does not fit, K has to find an action pattern that takes him from the ending state of the action pattern ES to his personal target state SZ/K. I.e. K has to start again with a1. (With IZ/K:= ES and with SZ/K unchanged) and follow the sequence of phases until a8. After having accomplished the interlude, he returns to a6. below.

a6 Since K wants to attain SZ/K (on the base of a1.), K *has the will* to apply the action pattern AP/K to his situation. This can logically be shown in the following way:

The general *will-rule* has the form*:*

If in BS X *has the will* to attain a certain state,
Then X *has the will* to perform a suitable action pattern.

Application of this will-rule to the situation here:
Here the initial state and the target state have to be interrelated by the action pattern given in a3. (AP/K) together with the conditions in a4. and a5.
If we apply the will-rule to the discussed case here (X:= K), we get:

If K has the will to attain the target state SZ/K,
Then K has the will to perform the (suitable) action pattern (AP/K).

a7 K accomplishes the action according to AP/K with the resulting state RZ/K.

a8 Because of a7., K *should* attain the desired target state. However, in reality there can occur contrarieties.
If the *resulting state* RZ/K is acceptable with regard to the expected target state SZ/K, K can go on in his program of doings.
If not, K can repeat the same action pattern (if possible) with more attention to the details or K can decide for another action pattern from the fan of possibilities in a2.

a9 After having attained his purpose, K goes on in his doings.

EXAMPLE:

e1 K has to decide for his travel route and the means of transportation. We follow the steps a1. -a8.:

a1 K is at village V1 (initial state) and K wants to arrive at village V2 (target state).

a2 His possibilities (action patterns) are: to go there by bus, by train or by his own car.

a3 He decides to go there by train. (I.e. the fan-fixing principle is applied to a fan of action patterns).

a4 However, the chosen train starts at town T1 and goes to town T2.

T1 lies near to V1. Therefore, K has to find a vehicle that takes him from V1. to T1. K starts his considerations again with a1.: K wants to go from V1. to T1., which vehicle to chose and so on.

a5 Since the chosen train goes to town T2, nearby V2., K has to find a vehicle, which takes him from T2. to V2. Therefore, K starts his considerations again with a1.: K wants to go from T2 to V2. etc. -

a6 Now K has made his whole plan to travel from V1. over T1 and T2 to V2. Therefore, K has the will to perform the chosen complex action pattern to his situation.

a7 K starts traveling and accomplishes the travel action.

a8 But since he missed the vehicle from T2. to V2., he has to go to V3. nearby by another vehicle (resulting state RZ/K). It depends on K's evaluation whether he is satisfied with this result RZ/K or not. If not, he chooses some other possibility.

a9 After having attained his purpose, K goes on in his doings.

This example shows how the goal orientation (the purpose) decides on the action to follow (*teleological* consideration) and what is the "action logic" behind it.

APPLICATION:
This action theory can be applied

- to thinking actions, including *logical thinking* procedures (cf. principle 12)
- to real actions including cooperative actions with the interaction of 2 or more persons (in a game)
- to communicative actions, as speaking and hearing (*speech acts and hearing acts*). (cf. principle 5 and 9)
- to *translating actions* of different kinds: between different languages or between different media (as audiovisual description).
- to the description of the steps in a *method* which brings you to a determined target state (methodology). (cf. principle 11)
- to *scientific research* as rational action behavior in science and humanities (cf. principle 13).

HINTS: The action principle has connections to some of the other principles namely those, which consider a development in time. I.e. virtually all time using principles are special cases of the action principle, because to follow a principle means to follow an action pattern under conditioning constraints.

Since man is concentrated on contents and goals, he does not observe his actions as such, at least as long as he works. Therefore, he normally is not able to account for the chosen way of doing. And structurally similar action patterns in different domains of life are not compared. It is the task of the philosophy of action to consider these doings per se.

LIT: -

REF: Wright 1977. From Wright's work started a ramified discussion.
TRA: Sunwoo.

9 Speech act model: a special case of the action model

IDEA: Why do we use different speech acts or speech act verbs?
The answer requires a combination of some of the principles (or theories) mentioned hitherto:

- The action theory:
- The kommunikant theory
- The language use model
- The sense-giving model.

Speech acts can be described on the base of the Sense-Giving Model: The parts of the Sense-Giving Model (cf. 7.principle 2.) lead to attitudes, which are expressible by a corresponding speech act verb. The verb has a conventional language depending meaning. In the first person it is as well as *symptom* for the *inner state* of the speaker.

As symptom it does not depend on the *language meaning* but on the a *cultural convention* for expressing inner states (beliefs, emotions, convictions). Different cultures express the feeling of e.g. sadness in different ways. As member of a culture one has to learn how to express the inner state. It can be considered as a "symptom code" of its own . With *"symptom code"* I intend a *code with a repertoire of codified symptoms* for the actual inner states of the speaker (and only of the speaker and in the moment of speaking!). The symptom code is a system of cultural conventions nearly independent of the sign language used by the speaker. The reference domain of the codified symptoms are the actual inner states of a speaker. The possible inner states are independent of culture and are common to all language users. One proposal to give a set of inner states is the sense giving model.

PRINCIPLE: Speech acts are codified symptoms for the *actual* inner state or attitude of the speaker K (towards reality and the other A) in combination with gestures, mimics and natural language expressions. The uttered content of a speech act is given as a sequence of signs in a language with conventional meaning. If the content is about the inner state of somebody different from K, K utters a description. if it is about the own inner state, then K utters in the first person his inner state. as speech act.

If from the situation of K and A it is clear to A what the attitude of K is, then K need not to use the corresponding speech act verb.

If e.g. K *needs help* from A, he must express this to A in some way.
The needs of speaker and hearer can be the basis for a classification of speech acts. We can classify speech act according to the Sense-Giving Model in two groups:

- The different active needs of the speaker and
- the different answering "reactive needs" of the hearer.

DESCRIPTION: Both types lead to different speech act patterns, which are in part universal, in part cultural dependent. This cannot be shown here. However, we see that speech acts come as pairs: the speaker expresses his need; the hearer reacts to this need satisfying it or rejecting it. This can be formulated in communicative rules for the interaction in a coherent dialog. However, in the next model we see that the pair wise consideration of speech acts is not enough.

Since speech acts are special cases of the action model, the analysis of every speech act verb has to follow the general action principle adapted to the linguistic facts. It is left to the reader to show this.

A speech act is understood by a hearer only if the hearer has intuition and sensibility for inner states of other persons as for his owns (recently the neurophysiologic basis of this phenomenon has been discovered as mirror neurons). These pre-feelings permit the hearer to find out the inner state of the speaker as well in the case that the speaker has not used the corresponding speech act verb, but another one. this phenomenon is called in linguistics: "indirect speech act". But it is not that the "wrong" indirect speech act verb has to be substituted by the right speech act verb, instead both express

EXAMPLE: We can intuitively understand what a person wants to communicate to us, if the situation is clear enough and if the need of the other person is intuitively recognizable. We can test this, if we go to a silent film or to a film in an for us unknown language. The same happens if we go to an opera without prior information. We can more or less understand the emotions and the interest of the participants, even if we do not know the concrete words spoken between them. The words must be within the expected fan of possibilities of feelings.

APPLICATION: When a speaker uses "I am happy" or when he expresses his happiness in gestures and mimics (culturally codified ways of expressing) or even when he is telling only the content of his happiness ("I am so glad that he did p" or "he did p finally!" said together with suitable gestures and mimics), he communicates the quality of *his actual* inner state to the hearer by using a codified symptom in combination with a language expression. This is a speech act (in my definition). In a speech act the speaker combines a cultural convention for symptoms with a language convention for lexical meanings. A child has to learn both types of conventions.

From the Sense-Giving Model one can extract different *attitudes or inner states of the speaker*: Claiming, confessing convincing expecting, hoping, fearing etc. as well *attitudes or inner states of the hearer* who reacts in different ways to the speaker attitudes. Therefore, we have *"hear acts"* as well*:* Those of expressing satisfaction with something: accepting, confirming, promising, applauding, corroborating, …. and those of disappointment with something: refuting, fighting, destroying, tolerating, ignoring, etc…

In the next model we see that the pair wise consideration of speech acts is not enough.

HINTS: Grice(1979) calls "natural meaning" what here is called "symptoms", and "non-natural meaning" what here is called "linguistic meaning".

LIT: Mudersbach 2008b.
REF: Austin 1972, Grice 1997, Searle 1971.
TRA: Sunwoo.

10 Tetrade model of speech acts

IDEA: speech acts do not occur as particular actions of a speaker. They are part of a situation, which contains all essential paraphernalia, which is needed for the success of the speech act. E.g. for the baptizing act one needs a child, parents, godfather and -mother, holy water, a name, the baptizing liturgy including the known speech act, and other means depending on the ritus etc.

Especially if the speech act is intended as a cooperative act, the reaction of the hearer is part of the cooperation. Therefore, we have the *speaker action* and *the hearer (re)action (*and eventually the (speech) *reactions of the other participants).*

All this has to be modeled under the aspects of need and satisfaction, acknowledgement

and contentedness. Observations show the following phenomenon: Suppose K has a need. When a person A has satisfied the need of K, K likes to thank A (*acknowledgment*). Then A shows his *contentedness* with K's acknowledgement for his help. All these verbal actions are speech acts occurring between K and A. Indeed there are 4 actions in succession. Therefore, I call the cooperation "tetrade of speech acts"

PRINCIPLE: The *tetradic model of speech acts* concerns the interaction between a speaker and a hearer. It has 4 steps:
t1 The speaker K utters a need towards the hearer A
t2 The hearer A reacts with satisfying the need of K.
t3 The speaker K expresses his thanks to A.
t4 The hearer A is content with the acknowledgement of K for his cooperation.
Each step t2, t3, t4 can have a negative outcome as well, if the considered person is not willing to cooperate. In this case it influences the following steps in an obvious way.

DESCRIPTION: Since it is clear from the formulation in the principle, I add here some comments: The tetradic model of speech acts is based on the simple *action model* (8.) in its application to *speech acts* (9.) enriched by the aspects: needs, satisfaction, acknowledgments, thanks and contentedness stemming from the *sense-giving model (7.)*:

If we add the reasoning from the *kommunikant model* (4.), we could as well distinguish between the view of K and his needs, etc. and the view of A and his (perhaps different) needs etc.

EXAMPLE:
e1 In everyday life: the dialog in a shop goes as follows:
t1 The client K asks for some ware (K expressing his need).
t2 The seller A offers him the required ware (A satisfying his need).
t3 K pays and says: "Thank you." (acknowledgment of K)
t4 A answers: "you're welcome" (A's contentedness).

There are specific expressions for the reaction in t4. This is an evidence for the indispensability of this 4th step in a respectful cooperation.

e2 If in a television interview the speaker asks the correspondent from outside or abroad for same information, the correspondent will answer. Afterwards the speaker thanks him/her and the correspondent expresses a positive final reaction in the sense of "you're welcome".

APPLICATION:
a1 First situation: a reader A is interested in getting more information on a certain theme.
t1 A needs a scientific (or a literary) text on a specific theme (A's need)
t2 K writes a text for the reader A (K satisfies the need of A)
t3 A is satisfied with this text (A thanks K)
t4 K is content with the reaction of A. (K is content)

a2 Second situation: an author K likes to communicates his findings to some readers A.
t1 K wants to communicate something to A. Therefore he writes a text. (K's need)
t2 A reads the text and gives positive feed back to K(A satisfies of the need of K)
t3 K is pleased with this reaction and expresses it. (K thanks A)
t4 A is content with the reaction of K. (A is content)

The tetradic pattern is independent of daily, scientific or literary texts.

HINTS:
h1 If one uses as well the perspectives introduced in the communicant principle, one can describe the tetradic interaction from the speaker's point of view and the sometimes differing view of the hearer. So one can describe the phenomenon of *mismatch* between speaker and hearer. The speaker expects the hearer to react in a certain way, but the hearer does not react in the expected way. And the speaker is frustrated.

Especially one can see: when the hearer has satisfied the need of the speaker, it has the consequence that the hearer then feels a "need" as well: he expects the recognition of his contribution. Therefore, this need of the hearer has to be satisfied by the speaker. This indeed happens when the speaker in step t3. expresses his thanks to the hearer.
In this case, the hearer can express his thanks to the speaker for having satisfied his need of getting acknowledgement (step t4. in the view of the speaker thus become step t3. in the view of the hearer).

h2 In a longer discussion one argument from one side is followed by an argument from the other side and so on. In this case the explicit steps t3. and t4. are not ignored, but simply postponed to the end of the discussion. During discussion each turn shows if you have accepted the reaction of the other side or if you insist on the recognition of your last speech act. Therefore, this behavior implicitly contains the steps t3. and t4.

LIT: Mudersbach 2008b
TRA: Sunwoo.

11 The concept of Scientific Method: a special case of the action model

IDEA: If you want to attain a certain target state in a rational way, you use actions according to some action pattern. The idea of a method is: to attain the ending state acting in different steps, which succeed each other in a rule based way. In every step, you have to do something in order to get from the beginning state to the ending state of this particular step: the ending state of step 1 is the beginning state of step 2 and so on.
Thus a method is an iterated application of the action model.

I distinguish the *beginning state* of the *whole action* from the *beginning state* of an individual step, and the ending *state* of the *whole action* from the *ending state* of an individual step. The action model in principle 8 above described one particular action starting with a initial *state* and ending with an target *state.*

PRINCIPLE: K has an aim. Starting at his specific initial state, the aim (the target state) cannot be attained with only one action. Therefore, K has to perform different steps. A method is a sequence of instructions hanging together in a chain. Each step is fomulated on the base of action patterns.
The method tells you, how to act in the initial state in order to go step by step to the target state you desire.

DESCRIPTION: Each step in the chain starts with the initial state (which is the target state of the step before). The step consists in doing an action or in taking a decision between different possibilities. This leads to a result, which is the target state. At the end of each step, you have to evaluate if you are satisfied with the result, as it was described in the action

model step a8.

Each step can use paraphernalia as means, helping persons or helpful objects, and communication tools. The instructions have to be given in such a way that a competent user is able to apply it at the initial state of a step.

EXAMPLE:
e1 A cooking recipe is a holon with static holemes (the ingredients) and phasic holemes (the preparation procedure). This contains a step-by-step method to elaborate the ingredients using appropriate ingredients with a hopefully tasty result.
e2 Instructions for some technical device (cf. Sunwoo 2008 in this volume).

APPLICATION: In every science, you have to learn methods of deciding, calibrating, measuring, and controlling actions and tools.

In humanities, the concept of method is not as rigorous as described here. Unfortunately the results therefore are less rigorous as well. Nothing and nobody should hinder a scientist in humanities to change hermeneutic "methods" in more powerful methods, which have the prospect of initiating and controlling a sort of progress that humanities mainly lack until now.
In text sciences (linguistics, philosophy, etc) and in translation science one can formulate scientific methods for analyzing and translating texts (cf. Mudersbach 1991, Sunwoo 2008). The translation purpose can lead to a method which prescribes, how to translate a given text. (cf. Sunwoo 2008 in this volume)

HINTS: The term *method* is used in very varying ways in science and practice. The concept intended here describes how to *operationalise* the way to attain the aim.
Connections to the other principles are:

- The *fan fixing principle* is part of a methodological step, in which you have to make a decision.
- Holon principle: The scientific method developed here can be seen as a holistic process described in phases following each other rigorously.

LIT: Mudersbach 1991, Gerzymisch-Arbogast & Mudersbach 1998, Mudersbach 2008a.
REF: Gerzymisch-Arbogast et. al. 1999, Mudersbach 1996, 1998, 1999, 2004.
TRA: Sunwoo, Will

12 Pragma-logical inference: a special case of the action model

IDEA:
Language user are able to clearly distinguish between 3 types of sentences:

- A sentence with contingent *information* (e.g. this child is sick),
- A sentence containing *a law or a rule* (e.g. if a child has a temperature, it is sick) and
- A sentence, which shows the application of a law to some contingent information, as it is used in an argumentation. (e.g. this child *must be* sick, because it has a temperature).

A person K uses a *pragma-logical thinking action of inferring*, if K applies a law to her information and draws the conclusions from this application.

e.g. Information: This child has a temperature.
Law: If a child has temperature, it is sick.

Application of the law to the information leads to:

Conclusion Therefore this child *must be* sick.

Inferring is a *necessary* transition, but necessity of the pragma-logical action does not imply truth of the conclusion (except in mathematics.). After having drawn the conclusion it is still open to the user K to accept the *inferred assumption* or not. K's decision to accept it depends on the comparison with the hitherto believed information. If K has no information, he may accept the conclusion as true. If K has a different information so far, he can decide which information he wants to believe more: the conclusion or his evidence (Cf. C2., C3. below).

This is the idea concerning logic, everyday people uses. It is quite different from the mathematical use of logic and even from syllogistic use of logic. Logical thinking has nothing to do with objective truth, because even in a fairy tale the reader can apply this logical thinking principle.

Therefore, a speaker uses *his* laws, in which he *subjectively* believes, independent of objective truth. Even from superstitious belief he can draw his consistent conclusions.

PRINCIPLE and EXAMPLE:
I prefer to give you the principle illustrating it by an example and to give the formal description later.

L1 Suppose a kommunikant K meets (or hear about) a person P with red hairs.(Ks initial state).

L2 K wants to know if P is choleric or not? (K's aim).

L3 K asks himself if he has laws which lead from the quality *red hair* to the quality choleric, perhaps together with other qualities or in more than one step.
- Suppose K finds as one of his (individual subjective) laws of experience for example
"A redheaded person is choleric" (which certainly is not true in an objective sense.)
This can be translated into the general form of law: <*to be F* implies *to be G*> as*:*
To be a redheaded person implies *to be choleric*.

L4 K checks, if the premise of his law is applicable to P:
Is this *person redheaded*? YES!

L5 If so, K can apply his law to this person P and infer:
This person ***must be*** choleric too.

This is a modal formulation of the conclusion, since it is not a true statement, but an *inferred assumption*!

That is the conclusion from the law by the pragma-logical action of *inferring* is necessary action, but it has not the semantic feature to be true (or false), because it ha snot yet been confronted with information about some reality.

L6 Therefore, K still is free to accept (or not) the conclusion of his law with regard to this person P: Is P actually choleric? YES or NO?

L7 The answer needs a decision of K. The decision is not part of the pragma-logical action.
L7.1 In the case that K has no actual information, K cannot decide the question. Then K can express only the assumption concluded from the law:
d has F and therefore d *must have* G. equivalent to:
d *must have* G, because d has F, equivalent to:

Since d has F, d *must have* G too.

L7.2 If K in the meantime has got actual information about P and cannot imagine that P can react cholerically, then K refutes his conclusion and says to himself:

*"Although (*I know that,) P is a redheaded person (and therefore *must/should* be choleric), P is *not* choleric. (Concessive use or non monotonic reasoning).

L7.3 If K in the meantime has got actual information about P and has evidence that P can react cholerically, then K accepts his conclusion because of evidence and says to himself:

"Since P is a redheaded person, P is choleric (causal or justified reasoning).

DESCRIPTION of pragma-logic:

Pragma-logic has the form of a thinking action (following the action principle):

L1 initial state: You (= K) know an object d, which is F.

L2 your aim (target state): You would like to know, if d is G as well.

L3.1 law as action pattern: You look in your law set for a law:
(LW1) *to be F* implies *to be G* (or in conditional form: *whatever is F, is G*) .

L3.2 Suppose you (=K) find such a law. Then you use the general pragma-logical form LFORM (X,Y, INF):

If the concept X is part of an information INF,
then the concept Y is part of the information INF too.

Here INF is a variable for the information about reality or a fictitious story K is acquainted with.

L3.3 From your law LW1you substitute X:= F and Y:= G and get LFORM(F; G, INF).
Then you get the specific pragma-logical action pattern LFORM(F,G, INF):

If the concept F is part of INF, <antecedens>
then the concept G is part of INF too. <consequens>

or more fluently: *to be F* implies *to be G.*

L4 Since you have the information (from L1.): the object d is F,
you define INF:= d and *apply* LFORM(F,G,d) to get the question:

Is the concept F part of the object d? (YES1 or NO1?) <premise>

L5 From the application of the consequens of the LFORM(F,G,d) to d you get the assumption: The concept G *must be* part of d.
And this leads to the question:

Is it actually the case for you? YES2 or NO2?
<conclusion as inferred assumption>.

L6 Therefore, K still is free to accept the conclusion of his law with regard to the object d.

L7 The decision depends on your knowledge about the object d.

L7.1 Suppose: you have no information, whether d has the quality G or not, you cannot decide the question. This is the case: <YES1, YES2 or NO2>. Then K can express only the assumption concluded from the law in a modal formulation:

d has F and therefore d *must have* G. equivalent to:
d *must have* G, because d has F, equivalent to:

Since d has F, d *must have* G too.

L7.2 Suppose: based on your information about d, you know *contingently* already that d has G, you choose the option: <YES1, YES2> (causal or justifying reasoning:).
This means: now your *so far contingent* information (d is G) can be justified now by the reasoning:

d has F and therefore d *has* G. equivalent to:
d *has* G, because d has F, equivalent to:
Since d has F, d *has* G too.

L7.3 Suppose: based on your information about d, you know *contingently* already that d has *not* G, then you choose the option: <YES1, NO2> (Concessive use or non monotonic reasoning). This means: your *so far contingent* information *d has not G* can be seen now as contrasting to the premise information *d has F*.
Therefore K refutes his conclusion and says to himself:

*"although (*I know that,) *d has F* (and therefore d *must/should* have G), d *has not* G. (Concessive use or non monotonic reasoning).

This last step depends on your comparison with what you know from your reality or the information you have. The pragma-logical action L1.- L6. follows the action principle. In the last step you compare the resulting assumption with your information.

In Summary, this pragmalogical form admits in the last (decision) step the following combinations:
C1 <YES1, YES2 or NO2>: assumptive reasoning, expressed by:
Since d has F, then d must/should have G.
C2 <YES1, YES2> causal or justified reasoning, expressed by:
Since d has F, (therefore) d has G.
C3 <YES1, NO2> concessive reasoning (non-monotonic reasoning): expressed by:
Although (albeit, even if) d has F, (nevertheless) d *has not* G.
C4 <NO1, NO2> counterfactual and hypothetical reasoning: expressed by:
counterfactual sentence types:
If it had been the case that d has F, it would have been the case that d has G.
equivalent to: If d had been F, d would have been G.(counterfactual reasoning)… OR:
hypothetical sentence types: ….
If it were the case that d has F, it would be the case that d has G. equivalent to:
If d had F, it would have G.
C5 <NO1 YES2> "surprised" reasoning:
even if d has not F, nevertheless (astonishingly) d has G.
C6 <YES1, YES2 or NO2> but <NO1, NO2>. "presuppositional" reasoning:
In this case the antecedent is a presupposition or prerequisite without which the consequent can neither be the case nor not be the case (it is impossible, if the prerequisite is not fulfilled.)
If F applies to d, then it is possible that G applies to d BUT
If F does not apply to d, then it is not possible that G applies to d.
e.g. If a farmer has a donkey, he can care for it or not. BUT
If a farmer has no donkey, he cannot care for it.

None of these 6 options are representable in formal logic! That is why in formal logic the conclusion is true without any confrontation with reality. Therefore the so called *non-monotonic* reasoning has created a lot of unsolved problems for formal logic (cf. Thomason 1994).

Causal sentences are refuted by this logic. Any argumentation in the direction of pragmalogic would shake the foundations of formal logic: truth semantics and the definition of implication.

In pragmalogic these natural ways of human reasoning are explainable and systematically generated from one logical form.

"YES" is the substitute for the K-dependent truth value *K-true* (I.e. the person K *holds for true* and therefore answers with "yes"). This value has nothing to do with the act of inferring, because the resulting conclusion is still open to acceptance (K-true, YES) or refusal (K-false, NO). After the conclusion K decides among C1., …, C6., which one corresponds to his information.

APPLICATION: There are different application types of law:

a1 the simplest form of law is the relation of implication between 2 *concepts* F and G. This is not as in extensional logic an inclusion relation between 2 sets of individuals representing these properties F and G (Cf. Montague 1974).

a2 instead of 2 concepts a more general form uses 2 schemata of *states of affairs*, which are combined by the relation of implication.
e.g. *If a farmer owes a donkey, he cares for it.* Or equivalently:
Every farmer, who owes a donkey, cares for it.
This means in pragmalogic that in your information state you have to control if you have a person with the quality *farmer* and with the relation that *he owes an animal* with the quality *donkey.* Then your law says that *that person cares for the donkey.*
You see that both types of sentences are interpreted in the same way.

a3 Another type of application is: the law is *prescriptive.* I.e. the conclusion contains a prescription: somebody has to do something in the case that the premise is fulfilled. E.g. *If a farmer owes a donkey, he has to care for it*. Or equivalently:
Every farmer, who owes a donkey, has to care for it.

a4 Another special case: the law is *holistic*. In this case the inference is based on holistic knowledge (Cf. 13.).

HINTS:
h1 pragma-logic is a special case of the action theory

h2 the original formulation of syllogism in Aristotle does not contain the form: *all F are G* but the form *to be G* applies to *every F*. (cf. Stekeler-Weithofer 1086).
Since we treat logic not on extensions (all F, every F), but on intensions (concepts in classical logic), we use the form: *to be-G* applies to *to be F*.

h3 for the comparison of pragma-logic to the logic of implication by Philon: see Mudersbach 2005.

LIT: Mudersbach 2001, 2005.
REF: Montague 1974,Thomason 1994.

13 Holistic logic as special case of pragmalogic and holism

IDEA: Since a holon has necessary parts, one can use this holistic knowledge for holistic inference patterns.

PRINCIPLE: From a concrete case of a holeme, you can infer the presence of the corresponding holon. and from this holon, you can infer the presence of each other holeme belonging to the holon.

DESCRIPTION: If you know a holon, a holistic gestalt, you know as well which parts are the (necessary) holemes. So you can infer from the holon that each holeme must be present in the case of a concrete example of this holon. The logical action of inference is an application of the inference described in pragmalogic (cf. 12.).

EXAMPLE: if you see (or hear about) a hand, you can infer that there *must* be 5 fingers as well. I call this the holon-holeme inference (or mnemotechnically: the hand -finger logic).

If you see (or hear about) only one finger in a situation, you can infer that there *must be* the holon "hand" as well. This I call the holeme-holon-inference (the *finger hand logic*).

As an application of both types, you can infer as well from the mentioning of one finger the existence of the other 4 fingers. This is the holeme-holeme-inference (*finger-to-finger logic*).

APPLICATION:
In the 2. principle I have already described the action of kantifying and dekantifying. Now we can see that this acts are the both holistic inference types holeme-holon-inference and holon-holeme inference.

In a cultural tradition you can infer each phase of the cultural system. E.g. If you entered to late into the cinema and you recognize a certain part of a cultural ceremony (e.g. a wedding ceremony), you know which phase it is in the wedding procedure (holon recognition in a holeme-holon-inference) and you know which phases are to come and which phases must have been past already by holeme-holeme-inference.

HINTS:
holistic logic is an application of the pragmalogic, which is an application of the action theory.
LIT: Mudersbach 1999, 2001

14 Principle of scientific work (research and text) (see fig. 6)

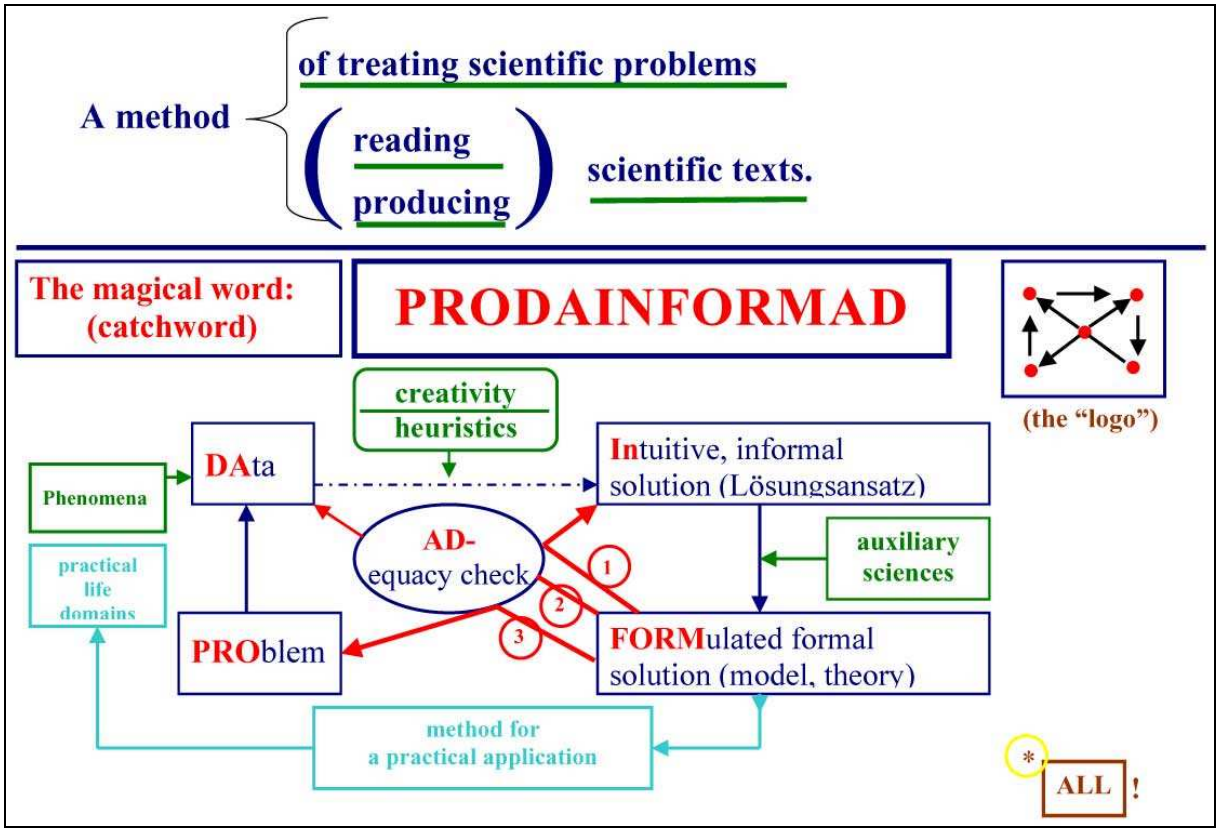

Fig. 6: Principle of scientific work

IDEA: There are three questions:
q1 Is there any general way to *proceed in scientific research* covering natural science and humanities?

q2 Is there any general way, how a scientist should *write or read a scientific text, which* covers both fields of science: natural science and humanities?

q3 If q1 and q2 are answered positively, one can ask the 3. question: can one subsume these 2 activities of a scientist, researching and describing his research, under *one general procedure* to follow?
I think there is one. Here my proposal: The PRINCIPLE of scientific thinking, working and writing is expressible in one magical word:

PRODAINFORMAD.

If you know this word, you can answer the 3 questions above and treat your problems along the instruction behind this word.

The word has to be segmented into PRO-DA-IN-FORM-AD with the following meaning:
PRO: is the PROblem (or question) to be solved.
DA: is the set of DAta illustrating the problem (and to be explained by the solution to the problem).
IN: the INformal INtuitive tentative approach to a solution.
FORM: the FORMal solution of the problem given as the detailed accurate realization of the intuitive solution in a rule based special purpose language or a formal

(mathematical or logical) language, using precise operations and instructions. This is called a theory (or a model) for the given PROblem. If you apply this theory to the DAta, it gives you the solution SOL(PRO) to your problem PRO.

AD: the solution SOL(PRO) has to be tested under 3 questions of adequacy:

AD1 Does SOL(PRO) give an *adequate account* for the INtuitive approach?

AD2 Does SOL(PRO) give an adequate description of the DAta?

AD3 Does SOL(PRO) give an adequate solution or answer to the PROblem?

Having followed this procedure, you have accomplished your job (of research or writing or reading a text).

DESCRIPTION: since the parts of the magical word are described in the principle above, here I add some comments:

PRO: the problem contains as well *the state of the art*, because on one hand you have to give an introduction leading to the formulation of your problem based on already known results of science, on the other hand you have to discuss hitherto existing solutions to the problem, telling why you are not satisfied with this solution.

DA: the data should be selected only under the given problem, not in regard to a given or assumed theory, that is, they should be produced independent of the theory to follow. Empirical data should be extracted by some empirical methods from the phenomena or measured by some calibrated measuring device in prepared "pure" cases using sequences of systematically varied parameter values.

The data should be independent of a following theory in the sense: they should not be selected secretly on the reasoning, what can fit the solution strived for. Otherwise, you commit the fallacy of a vicious circle.

The parameter in the data should be as explicit as necessary. Statistical results should be reflected, before you try to explain them by a theory.

IN: the way from the data to the intuitive solution is a heuristic "terra inkognita". The traditional opinion is: Heuristics need a creative inspiration. There is no method for intuitive solutions.

I doubt on this. There is a possibility to guide heuristic intuitions, namely by the principles proposed here. One of their tasks is just to pilot the first ideas.

The principles can help:

- to decide which perspective you would like to use for the phenomena (e.g. if you choose an atomistic or holistic approach, or if you decide for one level in the ICS principle) etc.,
- to find some hints, how some parameters possibly are correlated (deterministic or probabilistic)

Other piloting devices are analogies to gestalts in other domains or sciences, which can inspire a solution. (Think on Kekulé's dream of 6 serpents as an analogy for the benzol molecule) or Mendelejews inspiration on the chemical periodic system which he has got from the game of "patience".

The intuitive informal approach has the function to prepare the formal solution. It cannot in itself be precise already, but it can specify the demarcation against ideas, which should not be adopted.

FORM: the formalized (or explicitly formulated) solution can make use of auxiliary sciences (as mathematics, logics or computer sciences) and analogies or pictures from other sciences,

if they are not purely used as metaphorical surrogates.

AD: the three adequacy procedures seem to be superfluous to the scientist, who has just found the solution and who is convinced that it is the right solution. Therefore it seems to him to be a pure repetition. But even if you should force yourself to make this check, it will bring you insights, for example:

AD1: checking the adequacy to the intuitive solution, you may remember some details, which on the way of formalization unwarily you have lost.

AD2: trying to fit the data in your first approach, you will notice that your theory cannot be applied to all data. Suppressing these data in the publication would be the wrong way. Whenever your solution is not quite correct or not complete, it is the best hint, how to improve your theory (doing it yourself or leaving it to somebody else.). This produces *progress* in science. A perfect solution makes the whole field uninteresting for the next generation.

AD3: If you state clearly which part of the problem you have solved and which not, it helps other scientists who want to compare different solutions to the same problem. If you add a list of new questions or problems coming out of your solution, it is helpful for the younger scholars as well.

Two comments on the whole procedure:

1. A dream of mine is the following: suppose every scientific article in humanities and philosophy would follow exactly this "magical" procedure! How easy would it be to understand the strategy and the results! And how easy would it be to compare different results and to base an article on these findings!
   What is already possible in some domains of natural science, i.e. clear structuring under a given and accepted textual convention, why should I not be possible as well in the humanities which otherwise seem to make never progress?
2. If you are clever enough, you can try to formulate a *method* for the exact, competent use of your theory. Persons working in practical fields can learn to use the method for their practical problems without the need of studying the whole theory. In this way, a good theory helps as well to improve the practical work and even to create in the future a new "applied science" or technology.

   I have said that this magical word is not only applicable to the process of researching but as well to the process of writing or the process of reading and understanding a text. I cannot go into details here but it should be clear how to do this. Since a scientific text mainly reports the scientific procedures and results, the description should follow the line of research. - But most texts in humanities and philosophy do not. They are very cumbersome to read and to understand. First you have to find in the text, if and where a (the?) problem is formulated and so one. A good didactic instruction for students should teach them in the first place, how to control these five checkpoints PRO, DA, … in a given text and not to hesitate in criticizing, if the text is not explicit in this respect. This helps to a clear and firm handling of thoughts and it helps you to avoid these errors in the production of your own texts. A lot of the lifetime of a student or a scholar would not be wasted, if used in this way. That means your active lifetime would be longer.

HINTS:
The principles can play an important role in PRODAINFORMAD:

In DA: the principles help to decide which parameter to control or measure and how to project the setting.
In IN: the principles give you heuristic hints which phenomena und which parameters could be correlated systematically.
In FORM: the formulation has to take into account the parameters which are necessary for the theory.
In AD2: the parameters used in the theory are to be controlled under the aspect of coherence, whether they correspond to the parameters, which have been measured under a given principle. Both should follow the same principle.

For students and scholars: the efficiency of a method can be judged only by those who have *used* it!

LIT: Mudersbach 1997, 1999, 2008,
TRA: All contributions are structured more or less along this principle.

The network of the principles

Are the principles independent of each other? As we have seen already: some principles are special cases of another principle. So they are interdependent. They have not the function of Axioms. But what is the function of a principle? A principle is a *view* on a phenomenon or on a theory. If you put on the "eyeglasses" of one principle, you see a certain aspect of the object, other aspects are seen with other principles. For the most part principles are compatible with each other. Therefore one can look at the same object (phenomenon or theory) with a series of principles to see the different accentuations on the qualities of the object. Moreover one can view one principle with the glasses of another principle. This helps to understand a principle better.

If we want to see the interrelations between the principles, we need to define a dependence-relation between the principles:

A is basic for B means: the concepts and the statements of principle A are parts of the principle B. In other words: the principle B is (partly) based on the principle B. A --- ibf----> B is the abbreviation for A is basic for B. The relation ibf is transitive, but not symmetric and not reflexive.

In the following the interrelation network is formulated only with the numbers of the principles. The list of the principles is given before.

The list of principles:

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1. Fan-Fixing-principle
2. Principle of Atomism, Holism and Hol-Atomism
3. The ICS-principle (individual, collective, system level)
4. Principle of Kommunikant Views
5. Utterance Model of Language (hexagon model of language use)
6. Theme Rheme Model
7. Sense-giving model
8. Action model
9. Speech Act Model: a special case of the action model
10. Tetrade Model of Speech Acts
11. The Concept of Scientific Method: a special Case of the Action Model
12. Pragma-logical Inference: a special Case of the Action Model

13. Holistic Logic. a special case of pragma-logical Inference.
14. Principle of Scientific Work

The interrelations between the principles:

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1. -------ibf--------> 2., 3., 8.
4. -------ibf--------> 5. -------ibf--------> 6.
7. -------ibf--------> 5., 6.
7. -------ibf--------> 8.
8. -------ibf--------> 9. -------ibf--------> 10.
8. -------ibf--------> 11.
8. -------ibf--------> 12. -------ibf--------> 13.
8. -------ibf--------> 14.

From this constellation you can see:

a. the most basic principles are 1. Fan-Fixing-principle, 4. Principle of Kommunikant Views and 7. Sense-giving model. They are starting principles which are not based on other principles
b. 6, 10, 11,13 and 14 are terminal principles: the are not basis for any other principle
c. the principles with the most other principles depending on them are 8 and 7.

15 Summary

We started with the question whether natural science and humanities are so different in thinking that they cannot understand each other.

Seen as two "cultures" one could apply the proposal in Mudersbach (2001b): a translator who is acquainted with both cultures can try to translate the way of thinking in natural science for people in humanities so that they can apply scientific thinking to humanities. Or vice versa: He can try to translate the way of thinking in humanities for people in natural science so that they can apply thinking in humanities to scientific thinking. I think this would be a very difficult task.

The strategy proposed here is different: we looked for ways of thinking which are *common* to both cultures. this common ways are called "principles of thinking". We have found here 14 principles. And there may be more. For each principle the main thesis has been shown: that it is applicable to both: to natural science and to humanities; furthermore to daily life. In this way it was demonstrated that the same principle can be applied in both "cultures". It is up to the members of the respective culture to accept, that behind their special ways of thinking in their respective fields here is a general principle they have in common with the other culture. So the possibility to understand each other goes through generalization. In terms of translation theory: the principles form an interlingua and therefore a "lingua franca" between the different cultures.

In a historical dimension one could think: in the pre historical past the only one way of thinking has been – in an evolutionary process – bifurcated and diversified in different fields according to the needs of man. This idea goes in the direction of an idea insinuated by C. F. v Weizsäcker (1995, S. 973).

The other way around is the hope of unifying these different "languages" and to find an ideal language (of principles) behind the different ways to speak. That is more along the line of Walter Benjamin who looked for the perfect language.

In my opinion for the present situation would already be helpful to understand each other and to stimulate and enrich one "science culture" with the values of the other.

16 References

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