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Qualitative Research by the Method GABEK

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1 Introduction

*It is one of the central tasks of the social sciences and humanities to show ways and means of creatively processing complex problems in our society. Such problems are generally unstructured and difficult to define. Frequently they are tied to dynamic situations affecting a large number of individuals or groups of individuals. On the other hand the experiences gained by those affected, e.g. the employees of an institution, contain a creative problem solving potential. The GABEK method (**GA**nzheitlich **BE**wältigung von **K**omplexität – Holistic Processing of Complexity) suggests itself when trying to make systematic use of this potential. GABEK provides a new method which can be classified as a qualitative research method. GABEK can both be used for a detailed description and explanation of a problem situation as well as the practical development of aims and measures and their correlation. It is a problem solving procedure that includes the experiences and aims of all participants and individuals affected. GABEK develops its potential as an instrument of orientation and decision making, particularly in complex problem situations. It supports the development of strategic principles and operational measures relating to these The PC- program WINRELAN (**Win**dows **Rel**ation **An**alysis)[1] developed specifically for GABEK-applications, also allows the presentation of GABEK-results in an interactive way and in accordance to the interests of the audience..*

The example used in the presentation

As an example of the results obtained by GABEK [Zelger 1991, 1994, 1999a, 2000b] I use the INTAS-project 97-30221 „Ethical Conflicts in Medicine: a Cross-Cultural Comparision of Norms, Attitudes, and Subjective Evaluations in Austria, The Netherlands, Georgia and Ukraine“[2].

To reduce the size of the data base I will present here only results of open interviews in *The Netherlands*. In extended open interviews 20 laymen or patients and 20 experts in medicine were asked about their opinions on medical ethics. The answers of laymen and of experts were evaluated by GABEK-*WinRelan* separately. The texts of our open interviews were first imported from Word into a new *WinRelan*-file. I shall use the *WinRelan*-file with the results obtained from patients as an example.

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[1] WINRELAN 5 (© 1992 – 2003 J. Zelger, Innsbruck) was developed for GABEK-applications by Josef Schönegger & Josef Zelger, Department of Philosophy, Section Knowledge Organization, University of Innsbruck, Austria

[2] The project – paid by INTAS Brussels and the Austrian Ministry of Science encloses a qualitative study by GABEK*WinRelan* and a quantitative one. On the basis of the qualitative Research a quantitative questionnaire was developed. The cooperating team is: Zelger, J., K. Mühlbacher, M. Gustin (A), U. Hentschel (NL), L.F. Burlatchuk, St. Smovzh, E. Krainikow (UA), Kvatskava, N. Sumbadze, K. Dolidze (GE).

Questions and results of a standard GABEK project

In order to give an overview we summarize the chief questions and results of a standard GABEK project. The numbers next to the results refer to the chapters of the article. Here I will only describe typical results and some theoretical preconditions. Learning to use the method GABEK with PC-support through *WinRelan* ordinarily takes a training from 3 to 5 days.

Questions	**Results are given in form of**	**Chapter**
How can we reconstruct common concepts used in social groups?	Association graphs	2-3
How can we construct a holistic theory about the contents of the verbal data base on various levels of complexity?	Gestalten-tree	4-6
How can we represent cognitive assessments expressed in the verbal data?	Evaluation lists	7
How can we identify causal assumptions of the respondents?	Causal opinion networks	8
Which topics are relevant from the respondents point of view as values, possible aims or measures?	The order of cognitive relevance	9
How can we represent the emotional load of the verbal data?	Emotional graphs	10
Which groups of verbal data should be analized separately?	Statistical frequentnesses	11
How can different social groups learn from each other?	The simulation of dialogues	12

2 The representation of verbal data by means of an indexing system

In order to construct a meaningful order of the unsorted verbal data we need an indexing system. The development of an efficient indexing system requires two substantial operations: first of all we must determine what a "text" should be, i.e. the text units must be established. Such units should be meaningful short sections which form a mental unit, like a spoken record or a short spoken sense unit. Secondly, the content-relevant lexical concepts must be identified in each sense unit[3].

[3] The relevance of concepts is based on the consideration that a concept is content-relevant if one cannot eliminate it without changing the central topic (in the cognitive sense) of the statement.

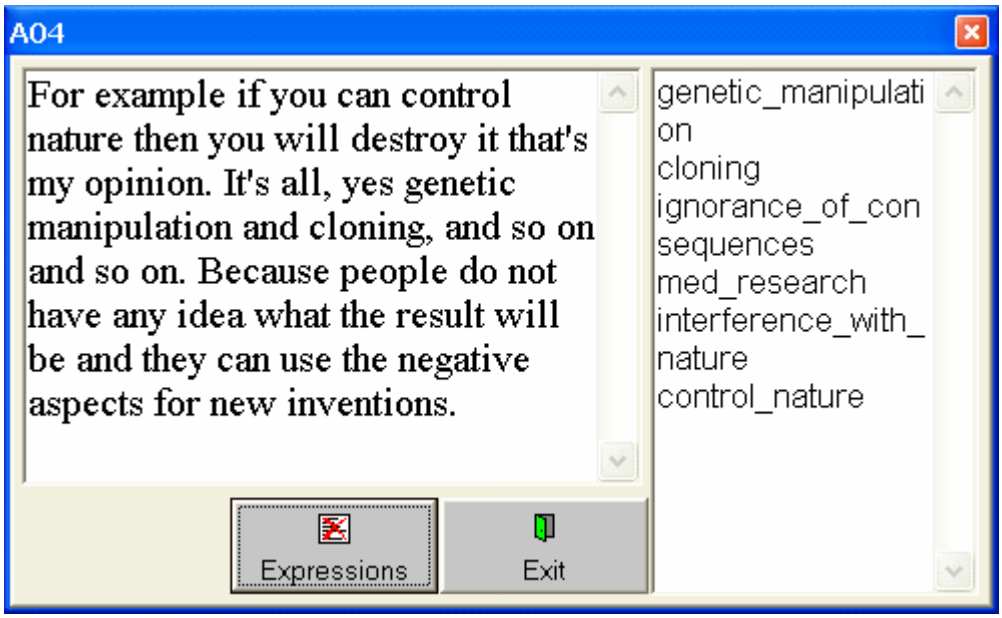


Fig. 1: The text unit „A04“ with key terms. The text is taken from one of the patients interviews.

“Text units” or "Sense units" are not to be understood as mere formal units, but as meaningful, coherent thoughts, which represent a comprehensible text containing at least three and at the most nine relevant lexical concepts. (As to the theoretical basis cf. Zelger 1991, 1994, 1995, 1999a, 1999b, 1999c, 2000b)
The definition of *key concepts* occurring in each text unit is referred to as *object-linguistic coding*. In this way, an indexing system is developed which can be represented as a formal network of expressions. However, on the PC the *indexing system* appears in form of a list, which can be arranged alphabetically or according to frequencies. In alphabetical order the list also serves to eliminate *synonyms or homonyms*.

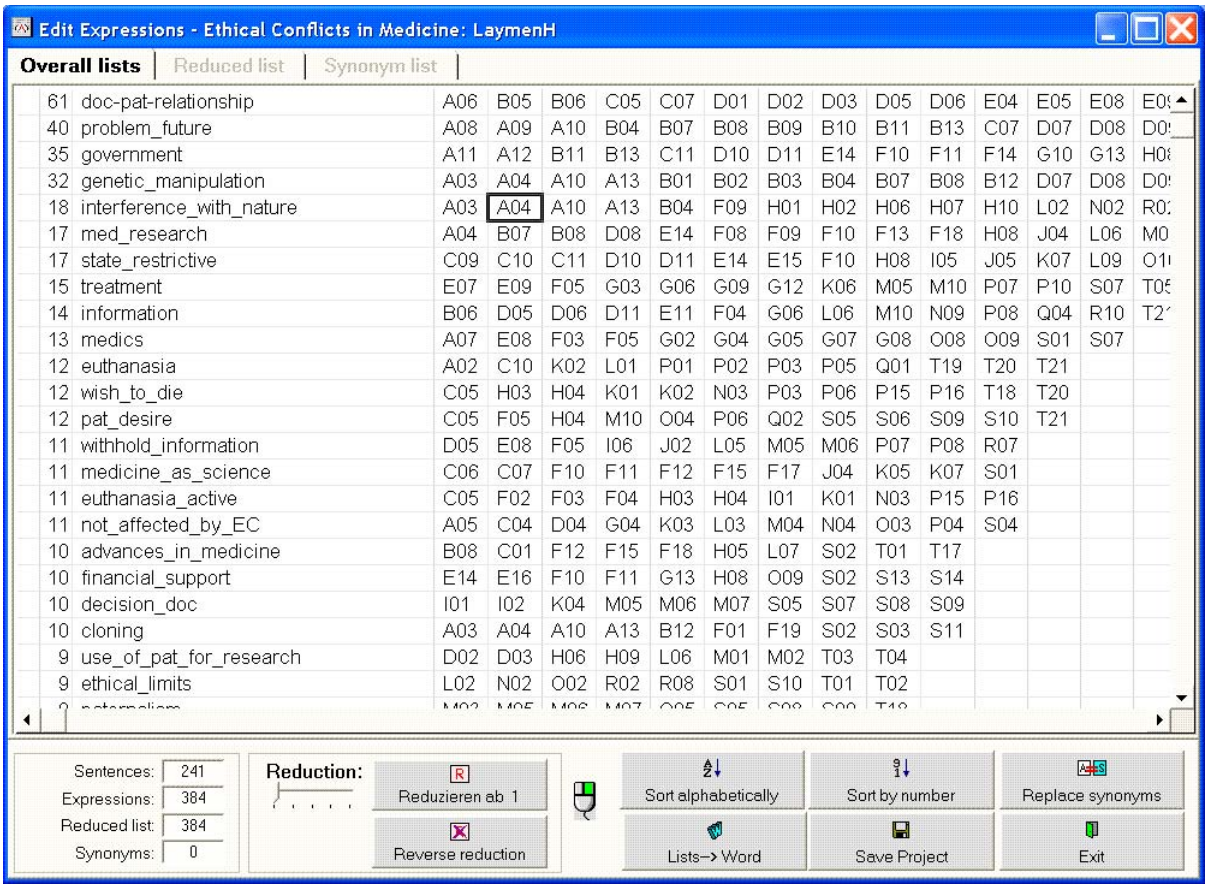


Fig. 2: The indexing system as a list of key expressions represented in order of frequencies. The alphanumerical expressions on the right side are names of text units which can be read by double clicking on them.

The indexing system enables the user *to find all the text units within the verbal database* in which the term occurs for any given concept. It permits the user to identify for any selected text unit all further texts that are in any way connected to the given text, so that they can be understood as content supplementations to the selected text.

Such an indexing system will allow for different forms of (graphical) representation of linguistic knowledge, all of which can be used for interactive inquiries on the PC and can be exported into Word for Windows.

3 The representation of association graphs, mindmaps and conceptual structures

According to Wittgenstein, the meaning of a term is given by its use in a language game in a concrete lifeworld. Therefore, the meaning of important terms that emerge in the course of discussions can be reconstructed on the basis of all the interview texts in which the term was used. They are exactly the ones which are always invariably or logically associated with the definiendum. This means that everyone who understands the language and uses the concept correctly also links the appropriate terms of the definiens with the definiendum - even if this does not always happen consciously or explicitly.

Drawing of association graphs

To reconstruct the meaning of a term in the context of our verbal data base we open the linguistic network  .

The expression list appears. In this list we mark an expression which is used frequently in the verbal data. Let us select *problem_future.* We use concepts as definiens which are very often connected with the definiendum in our verbal data base, since the concepts almost constantly connected with the selected term in many different texts are relevant for the meaning of the latter. So we receive the following graph:

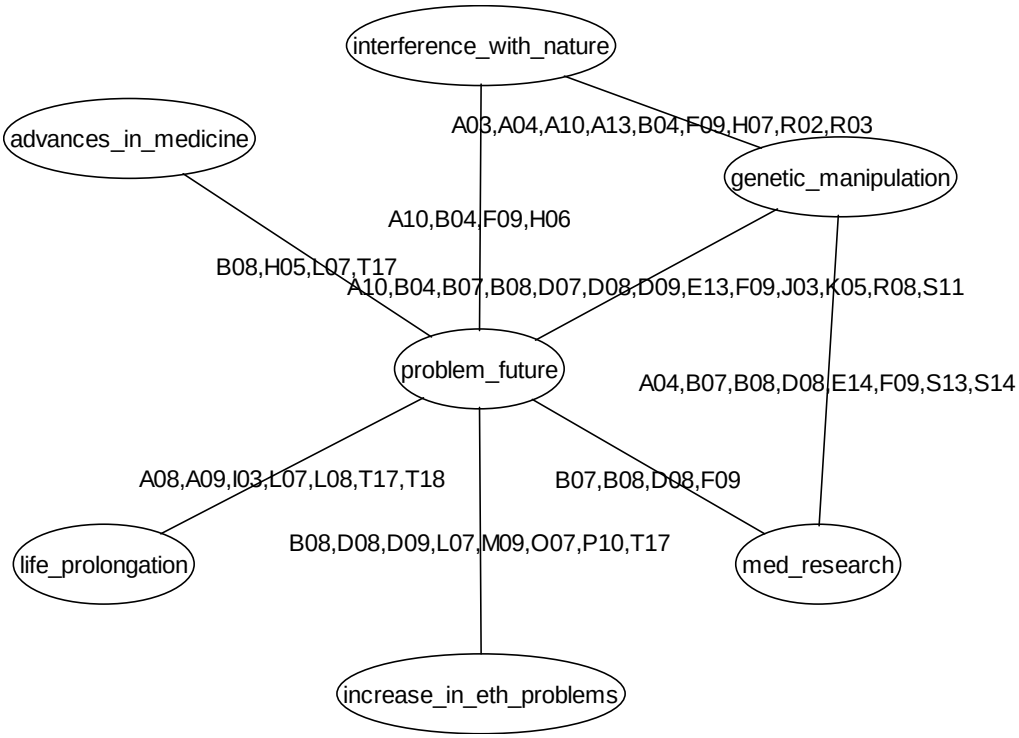


Fig. 3: The association graph for "problem_future" *in the context of the patients' interviews. Only those concepts are shown which are related to* "problem_future" *at least in 4 text units. The text units are indicated in the middle of the connecting lines. The texts can be read on the PC by click on any line connecting the terms in the graph.*

In the graph of figure 3 which was produced automatically from all texts of dutch patients with the explicit content of "problems future" we can see that the most usual associations (at

least 4 denominations) claim that (ethical) problems in the future will be connected with *genetic manipulation*, *medical research* and *advances in medicine*, with *life prolongation* and with the conviction that these will *interfere with nature*.

Extending the association graph to a mindmap

The association graph represents conceptual associations of a frequently occurring term, selected by the analyst. It can be extended by taking specific terms as the center of a new network of associations (e.g. *interference_with_nature*) in figure 4) In this way "mindmaps" of social organizations can be constructed on the basis of the verbal data.

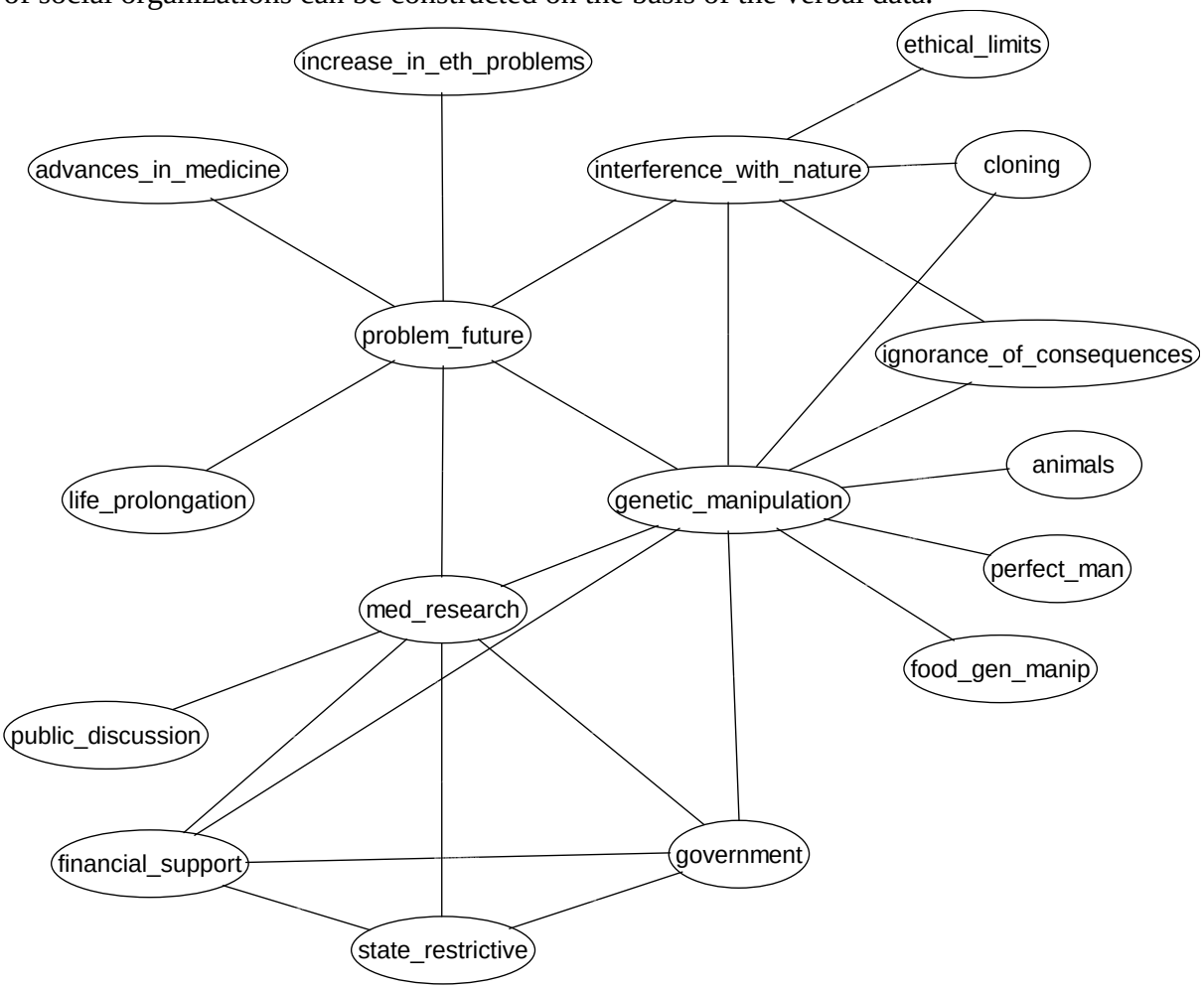


Fig. 4: Mindmap of the concept problem_future. *The relations are confirmed at least by 4 text units. It shows the most usual associations with it.*

Comparing association graphs of different groups

Using different verbal data it is possible to compare the linguistic use of terms by different groups, in order to determine possible common features and divergences. So one can even learn about the linguistic use of terms in everyday language discussions, i.e. the use of central terms in relation to the situation and the social organization.

Learning concepts

The more verbal data we include in the analysis the more stable will be the association graph and the more it will represent a more general *quasiconcept* of the selected starting term.

4 Clusters of sentences

Sentences can be seen as sets of expressions separated by various distances. Two sentences are considered closely related, if they have some expressions in common. They are separated if they have no common nodal concepts.

To find out the connections between the sentences we use the lexical concepts of our indexing system (cf. fig. 1 and 2) After coding all the verbal data, we can produce text groups with some common expressions by cluster analysis. WinRelan provides different methods of cluster analysis  . For details see Zelger [1996].

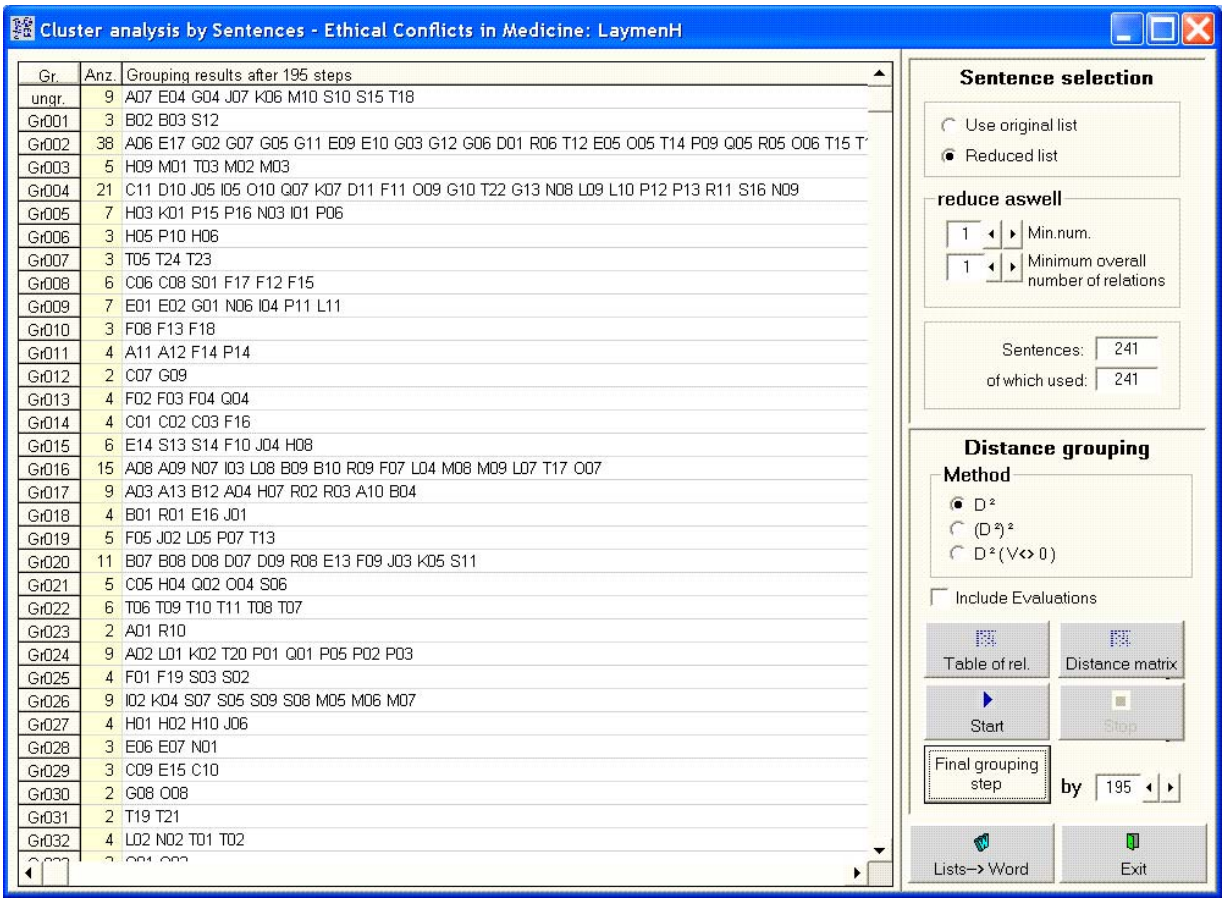


Fig. 5: Text groups built automatically by cluster analysis

***Example* of a cluster**

The following matrix of key expressions shows the cluster G006 of the three statements H05, P10 and H06 by patients.

	3	2	2	1
H05	problem_future	restore_to_health	disease_genetic	prenatal_diagnosis
P10	problem_future		disease_genetic	secondary_prevention
H06	problem_future	restore_to_health		use_of_pat_for_research

	1	1	1	1
H05	embryonic_research	advances_in_medicine	embryo	
P10	treatment_early	treatment	increase_in_eth_problems	predict

H06	drugs	interference_with_nature		

	1	1
H05		
P10	cancer_pat	genetic_engineering
H06		

In the cluster G006 the statements Ho5, P10, H06 are connected to a sentence group of three sentences by the three nodal terms

problem_future restore_to_health disease_genetic

.

H06 [Ethical problem in the future] It comes back really to a point mentioned earlier. Umm, I think that experimenting with people that could in fact lead to medicines or the cure for an embryo or something like that, that should not be permitted because I am simply of the opinion that that may not be interfered with".

H05

Now, what I really already mentioned at the beginning, medical science will progress [in the future] so far that we eventually will be able to see in the embryo what sort of medical defects there are indeed just by looking at the DNA structure from the unborn baby and that you eventually maybe through simple medical procedures illnesses can be diagnosed and cured.

P10

[I foresee the ethical problems in the future will increase.] Well, I think increase because before, if someone was sick well, ugh , you knew after they became sick. Now with the use of genetic and DNA research, or how you call it, illnesses can be predicted earlier and that has maybe good consequences if early treatment can prevent the disease or slow it, but on the other side what does it mean for people who learn that they will die of cancer in 20 years or whatever.

Using all the answers of the verbal data base we obtain a very complex linguistic net of sentences connected by nodal concepts In our case the verbal data base is given by 241 answers of 40 Dutch patients. These were coded by 384 key notions. 232 concepts resulted as nodal notions which connect sentences with each other in the data base. By cluster analysis 37 clusters of sentences were produced. One of these clusters was represented in the above matrix of expressions. But can we assume such clusters are relevant? Of course this does not have to be the case. The statements within a cluster can contradict each other. Normally they are redundant and very often they do not contain relevant knowledge applicable to a new problem situation.

To continue we have to answer the question how we can transform clusters of sentences into meaningful groups of statements. Thus we introduce the concept of a *linguistic gestalt*. Each text group should have the form of a linguistic gestalt: we eliminate the redundant statements in the cluster and search in the data base for further sentences which are a meaningful complements. Of course a large number of conditions must be fulfilled:

5 The rules of linguistic gestalt-building

To explain the conditions of linguistic understanding [cf. Zelger, 1999a, 2000b] the process of perception is investigated. Our world is perceived not by isolated sense data but through perceptive gestalten [Stumpf 1939, Smith 1988]. Stumpf identifies gestalten as complex relations between sense impressions. We select the relevant sensory information in terms of more or less regular distances between sense data.
Accordingly verbal data are understood not as isolated concepts but as coherent linguistic complexes, that is groups of statements forming meaningful wholes. Thus we can introduce the concept of a *linguistic gestalt.*

A *linguistic gestalt* is an abstract entity. It presupposes grouping in parts. These parts are statements (i.e. relations between concepts, in our terminology text units or file cards). The linguistic gestalt can be distinguished from the larger linguistic context through the interrelation of the text units with each other. The linguistic gestalt is seen as a specific meaningful group of text units which fulfils the following criteria:

a) *Formal connectivity*: All text units (sentences) within the group are closely connected to each other. *I.e. each text unit in the group must contain at least three key concepts which also occur in other text units of the same group*.
b) *Formal variety*: The text units (sentences) within the group must be sufficiently distinguishable from each other. Each text unit must contain something new so that it appears a kind of complement to all other text units in the group. This entails that,
ba) Each text unit in the group must be distinguished from all other text units in the same group. *Any pair of text units S_1 and S_2 must contain at least three concepts which are not nodal concepts connecting S_1 and S_2.* As a consequence any pair of text units containing the same key concepts is not admitted.
bb) *The key concepts of one text unit in the group may not be included in the set of the key concepts of another text unit in the group.*

c) *Formal distance*: The group of text units (sentences) should not contain too many text units so that all relations between the text units can be reconstructed as a unit of meaning. *The necessary steps to move from each text unit to any other text unit in the group must not exceed the maximum of two steps.*

For illustrative purposes we will show four formal structures which infringe the formal rules: In fig. 6 to 10 a circle indicates a sentence (text unit) and a rectangle a key concept. Nodal concepts show the connections between text units.

According to the rule of *formal connectivity* (a) the structure (6) is forbidden. (7) and (8) are not allowed by the rule of *formal variety* (ba) and (bb). (9) is excluded by the rule of *formal distance* (c).

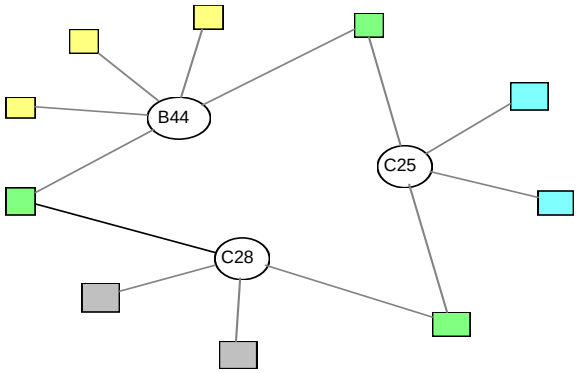


Fig. 6

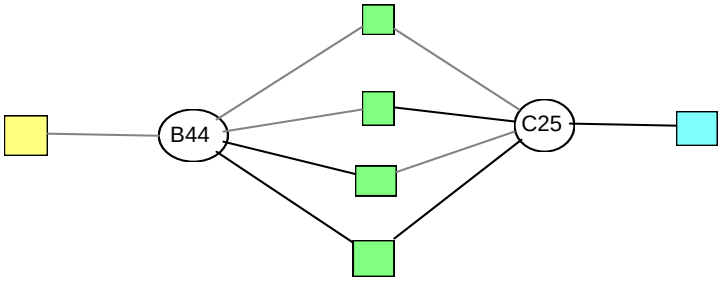


Fig. 7

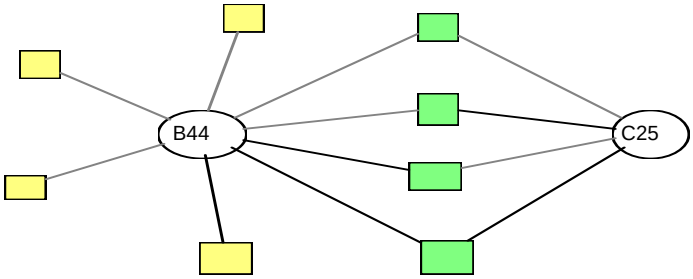


Fig. 8

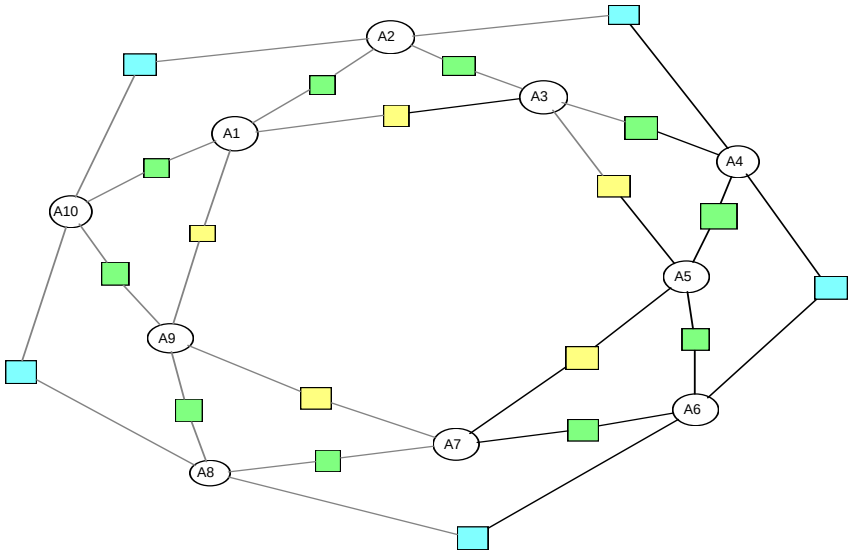


Fig. 9

The structure in figure 10 fulfils all formal conditions of a linguistic gestalt.

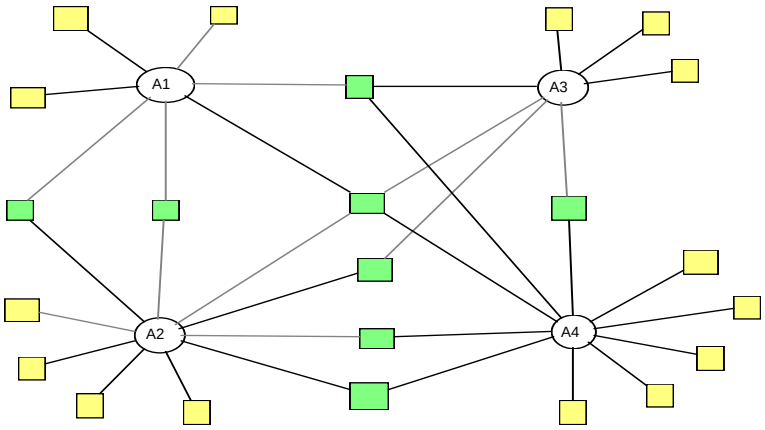


Fig. 10

A linguistic gestalt must furthermore meet semantic and pragmatic conditions:

d) *Semantic demonstrability*: *A group of text units (sentences) is rendered meaningful only if it is possible to demonstrate all relations between the text units intersubjectively. Therefore, an ideal paradigmatic example must exist fulfilling all the conditions assumed*. In particular in *communicative learning situations* it is necessary to refer to models, examples, applications in a given modelling facility. As suggested by Pask [1976, 1992], „modelling facility“ refers to the material immediately available to the individual, with which he can produce observable units, e.g. models which represent all the relations assumed by the text units in the group.

When analyzing texts it is not easy to comply with the above conditions. In particular the rules of *formal variety* and *formal connectivity* oppose each other. They lead to a kind of equilibrium. The more the sentences are internally differentiated, the more likely that they are not sufficiently internally networked. And: the closer the network, the more likely it is that the internal differentiation does not suffice. The PC-program *WinRelan* provides interactive methods to select groups of text units from the unsorted verbal data base which fulfil the rules for linguistic gestalten.

Subsequently we give an example of a linguistic gestalt

The linguistic gestalt *interference_with_nature*

The text group is built by the text units B04, H07, N02, L02, A10 und T01:

B04

[I see genetic manipulation as a problem:]Because in this way we are interfering in nature. On one side, something is developed which nature absolutely never intended, for example the mouse with the ear grown from cells. And on the other side, you don't know what the long term consequences are and then of course say in the plant industry or plant improvement it's said that yes, we can make the plants resistant to specific weeds, insecticides, certain insects, but what are the consequences of genetic manipulation on the plants in the long term. Certain consequences that we don't recognise now will surely become evident in the future. So once again, on the one side, the aspect that we are doing things that really nature, as we understand it normally, never intended and on the other hand, the uncertainty about our actions now on the affected organism in the future.

H07
In relation to human beings no [no circumstances under which new discoveries are acceptable], but if it was as we now have indeed with the manipulation of food, look I don't know exactly what the effects are from genetic manipulation of foodstuffs, but I can imagine that you finally develop a certain plant or vegetable that in a Third World country under very dry conditions would grow well and thereby fight the war on hunger. Now in that case I would encourage it, but as soon as it interferes in a fundamental way with a human being, then I say no, not that.

N02
[An example for ethical problems in medicine about begining of life:] At the beginning of life, how far should we go with technical means to help people fulfill their wish for children. And to what degree do we allow technology to take over for nature.

L02
[For example about creating life], there are recently more possibilities to decide on having children, not only about their sex but also maybe intelligence. I think that if I were a medical worker that would be very problematic to me. Where does it stop you know, where do all these possibilities end, the interference in human life.

A10
[example for the problems in the future] and the other thing is what I already said about cloning and genetics. Because it means that you control nature too much, you interfere too much, and in my opinion there is a balance in nature. And if man interferes too much the balance will be destroyed and we don't know what will happen then. The outcome is not clear so we will destroy ourselves, it does not matter, but...

T01
[In my opinion the most important ethical problems in medical science are:] How far can you go, with continuous weighting of how far man can intervene in life. I have the idea that they want to go still further in medicine and that they want to keep it in their hands and I don't really agree with that.

The text units quoted above are interrelated by the following nodal concepts which determine the chief content of the text group:

	6	3	3	3
B04	interference_with_nature	ignorance_of_consequences	genetic_manipulation	
H07	interference_with_nature	ignorance_of_consequences	genetic_manipulation	
N02	interference_with_nature			ethical_limits
L02	interference_with_nature			ethical_limits
A10	interference_with_nature	ignorance_of_consequences	genetic_manipulation	
T01	interference_with_nature			ethical_limits

	2	2	2	2	2
B04		problem_future	food_gen_manip		
H07			food_gen_manip		
N02	medicine_reproductive				children
L02	medicine_reproductive			human_life	children
A10		problem_future			
T01				human_life	

A group of sentences like the above example is already too complex to be conceived as a whole. We must focus on one sentence after the other to apprehend their connections. Later we will use *linguistic gestalten* as parts again to build still hierarchically higher wholes of meaning. We want to combine linguistic gestalten to form more complex *linguistic hypergestalten*. Therefore we must now reduce the complexity of the above text group. We represent the linguistic gestalt by a summary, one short statement or a few very short ones. It is a kind of condensation which allows further processing of the central ideas of the linguistic gestalt. The summary also is called „selective representation“. The formation of the summary again is governed by rules:

e) *The formal rule for selective representations*: For the condensation of contents as a rule we use the key expressions occurring more than once in the text group, i.e.: *The nodal expressions of the text group are the key expressions of the selective representation.*
With the rule (e) we presuppose that the contents of linguistic gestalten are determined primarily by concepts occurring as nodal concepts in the text-group. In our case the nodal concepts occurring more than once in the text-group and used as key-concepts to form the summary are: *interference_with_nature, ignorance_of_consequences, genetic_manipulation, ethical_limits, medicine_reproductive, problem_future, food_gen_manip, human_life, children.*
As a semantic rule the following must be fulfilled by the summary:

f) *The semantic implication-rule*: In every situation (example, model) in which all the sentences of the text group are true also the summary must be true. *I.e. the selective representation must follow as a semantic implication from the text group.*
Finally a pragmatic rule must be fulfilled by the selective representation i.e. the summary:

g) *Pragmatic applicability*: *The selective representation should be relevant for a person x in the situation S and the point in time t in the sense that x beliefs in S and t that the summary is applicable as perception-, orientation- or action patterns in a possible new situation.*

Using the above sentences about the topic *interference_with_nature* we create a summary and call this the *selective representation* of the corresponding linguistic gestalt. It runs like follows:

An important ethical problem in medical science are the ethical limits by interferencing in the natural development and its reproduction which will become bigger problem in the future. The modern technology replace the nature, for example genetic manipulation of embrios (deciding the characteristics of children), of human beings or of food. The question is how far man can intervene in life and nature (to not destroy the balance in nature).

If all the above rules (a) - (g) are fulfilled, then the textgroup together with the summary form the linguistic gestalt.

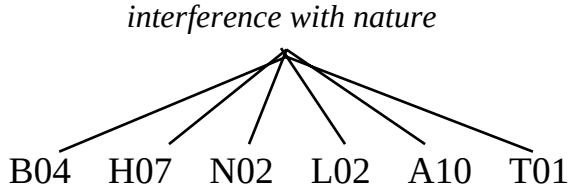


Figure 11; The linguistic gestalt "interference with nature" *formed by 6 text units and their selective representation.*

In order to obtain a coherent and holistic representation of the verbal data base all responses must be compressed into hierarchically structured text groups and represented in form of a *gestalten tree*. This is a hierarchical order of texts generated step by step from bottom to top by the GABEK method in a way that each text on a higher level follows logically from a text group on a lower level. *This leads to the result that linguistic gestalten always have a deep structure (the substantiating text group) and a surface structure (the summarizing text).*

6 The holistic representation of verbal data in the gestalten-tree

According to the above procedure the 241 answers of different patients in The Netherlands where condensed in the subprogram *editing Gestalten*  to 23 linguistic *gestalten* and to summaries of them. These again are used to form *hypergestalten* - according to the same rules of gestalt-building: when all text groups have been processed in this way, a set of summaries (selective representations) of text groups will be available to which the cluster analysis is again applied. The summaries of gestalten form text groups on the next higher level. For instance our selective representation about *interference_with_nature* was combined with six other summaries of linguistic gestalten to the hypergestalt *problem_future* (see fig. 12).

When all the text groups on this level are transformed into *hypergestalten* then we do the same recursively on the next higher level to form *hyperhypergestalten.*
The whole structure is called *gestalten-tree*. It can be seen as an ordered overview over all the verbal data.

As in a puzzle, sections (in *WinRelan* statements, i.e. responses) are arranged into a pattern. These patterns – (in *WinRelan* thematically interconnected text groups, which due to fulfilment of the semantic, syntactic and pragmatic rules, are called linguistic gestalten – see chapter 5) – again serve as puzzle pieces for the construction of even larger patterns. The large patterns (linguistic hypergestalten), which result from this information-compressing process, are finally joined to form an overall view (gestalten tree).

On the highest level of the gestalten tree for our project, the most important results of the investigation are summarized in two short texts. These are general trends similarly expressed in many interviews.
If we look at the opinions of the patients, we will find the following two texts, which can be regarded as total summaries, on the 4th. level of the hyperhypergestalten. If someone who has only a minute to spare asks for the result of the project, he can be given an answer with the aid of the following two texts, representing the results of the GABEK-analysis still in object-language as stated by respondents:

Hyperhypergestalt *future_problem*
An important ethical problem in the future is genetic manipulation. The technological development (advances) in medicine and medical science (medical research) could increase new ethical problems in the future.

Hyperhypergestalt treatment_decision
Morally incorrect behavior in the doc-pat relationship occurs if the doctor withholds the informtion about the patient's treatment. It should be within the autonomy of the patient to decide about his/her own treatment (pat desire).

We open the subprogram  *Gestalten tree).* There the resulting hierarchical structure of our gestalt building operations appear. We klick on the icon  and select the term problem_future. Then all the texts are marked in dark green colour where the concept *problem_future* occurs.

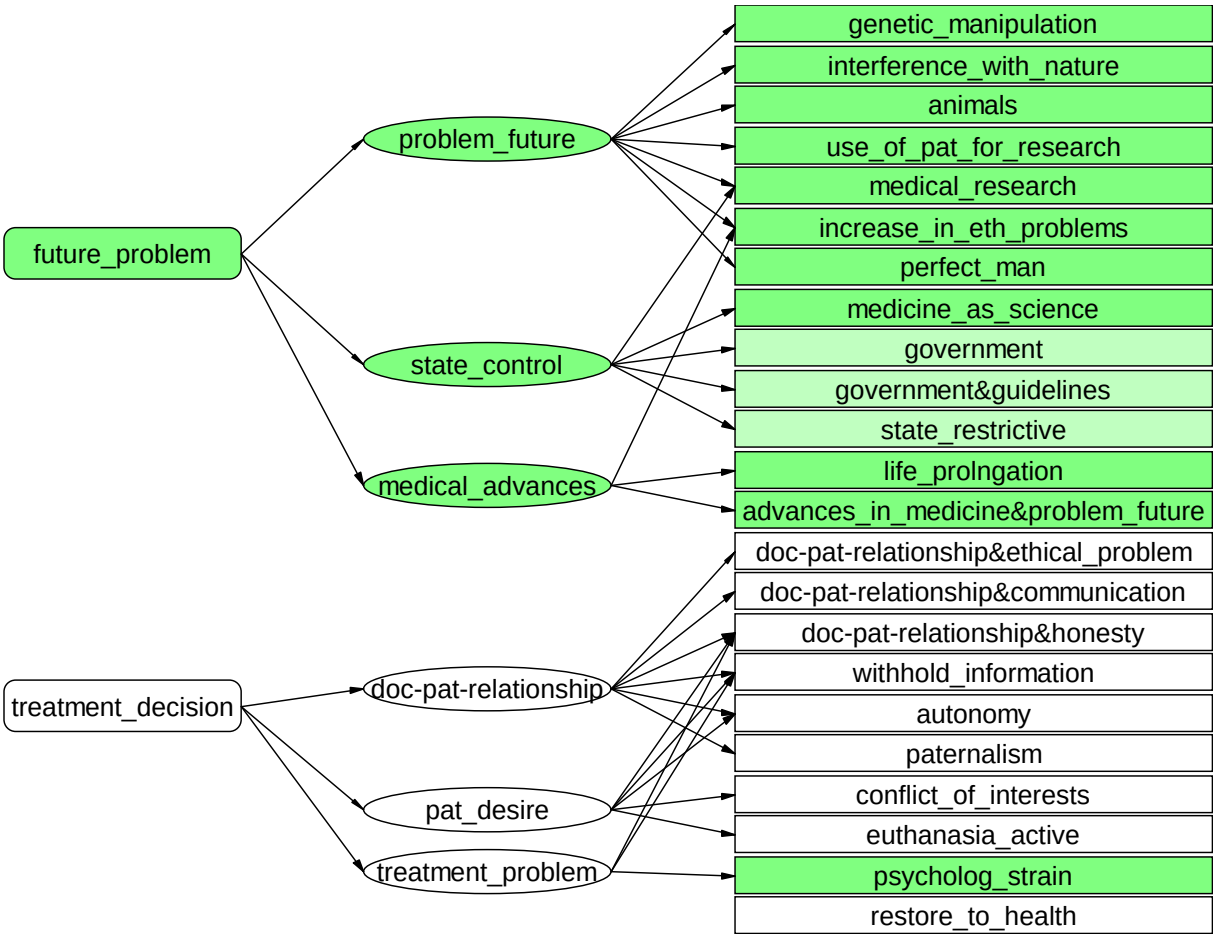


Fig. 12: Gestalten tree with marked texts about the topic problems_future*. One is able to cut out parts of the gestalten tree according to any key concept (as for instance the green part of our gestalten tree).*

In the gestalten tree we find the two texts on the left side. On klicking on the appropriate fields the corresponding text is displayed.

If someone asks for a *justification* for these two texts, then one will go to the lower level of the gestalten tree. There the hypergestalten are situated, which describe the individual ranges of topics in greater detail. The justification of the first Hyperhypergestalt *future_problem* through three hypergestalten reads as follows:

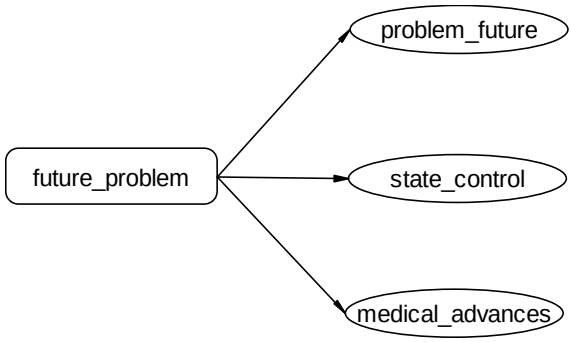


Fig. 13: Foundation of the Hyperhypergestalt future_problem *through three summaries of hypergestalten*

Hypergestalt problem_future
An important ethical problem in the future is genetic manipulation. Also, because of progressive medical development and medical research interfere with nature creating the “perfect man” more and more. This can increase ethical problems. The consequences of this kind of medical research should not be ignored.
Hypergestalt state_control
The government or the State should stipulate (restrictive) laws about the ethical problems in medicine. The ethical problems should be a part of public discussion too. The government has to control certain medical research like for example genetic manipulation, which could become a bigger ethical problem in the future but they should also support medical science or research financially.
Hypergestalt medical_advances
Because of the technological progress (advances) in medicine and medical science development new ethical problems will increase in the future. There will be more possibilities to prolong life and the question is how far we should go with this kind of treatment.

Below these texts there are the gestalten which justify the hypergestalten. Here ranges of topics from the analyzed data supporting the hypergestalt *problem_future* are represented in detail.

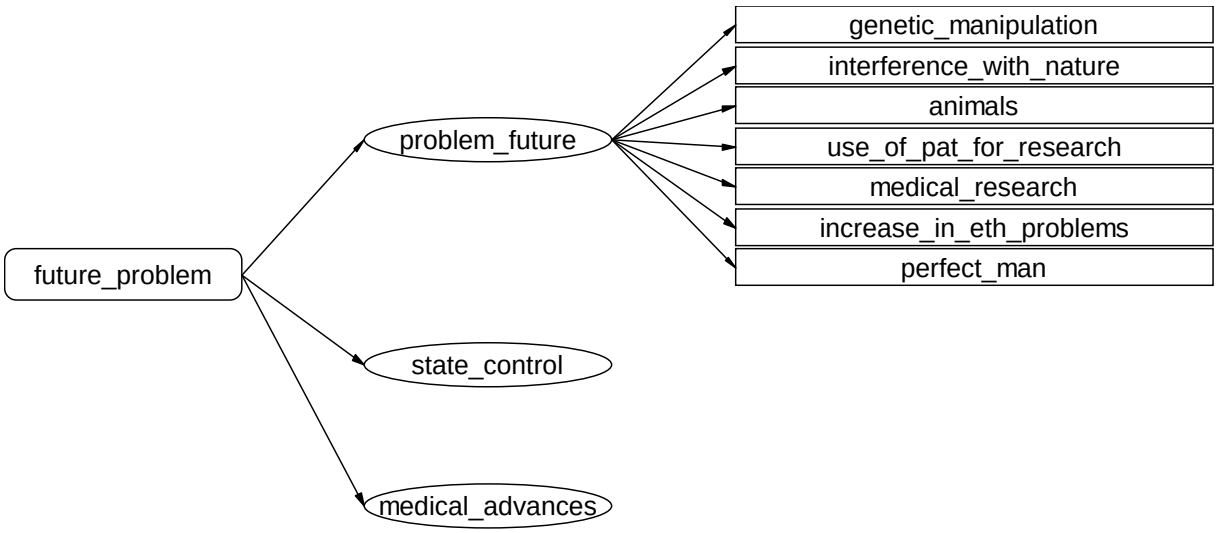


Fig. 14: Foundation of the text problem_future (hypergestalt) through three summaries of gestalten

Gestalt genetic_manipulation
Genetic manipulation will be an important ethical problem in the future. In medical research experts are trying to map out the human gene picture. On the one side it'll help with incurable diseases but on the other side it could be manipulated (for making"perfect" humans) and becomes commercial.
Gestalt interference_with_nature
The interference of medical science with the natural development and the reproduction of nature will become an important ethical problem in the future. Modern technology replaces the nature, for example genetic manipulation of embrios (deciding of their characteristics), of human beings or of food. The question is how far man can intervene in life and nature and where there are the ethical limits (not to destroy the balance of nature).
Gestalt animals
Animal experiments and genetic manipulation with animals are ethical problems. The interference with nature or human beings is an ethical problem too and will increase in the future.
Gestalt use_of_pat_for_research
Sometimes medical doctors use information for research or experiments. In doc-pat-relationship by medical research The doctor has to ask the patient for permission about using the patient for research or for drug tests. The problem which could increase in the future is, that medical research must be controlled in order to reduce the interference with nature.
Gestalt medical_research

Medical research as for example genetic manipulation, could produce ethical problems. In the future ethical problems will increase. They should be a part of public discussion. The government should make decisions about research too and support it financially. The consequences of this kind of medical research should not be ignored.
Gestalt increase_in_eth_problems
Medical development (advances in medicine) will increase (more) the ethical problems in the future. Some of them will be: possibility of genetic manipulation, "computer medicine" (people as numbers), xenotransplantation, artificial lengthening of patient's lives, artificial giving of life, use (abuse) of secondary prevention.
Gestalt perfect_man
One of the ethical problems in the future is cloning by genetic manipulation. People are trying to be smarter than God and they'll try to make their image more beautiful than it already is - a perfect man.

On the level of gestalten again we can *ask for justification*. In such a case we click on the corresponding field of the gestalt (on the right hand of fig. 12 for example on the gestalt "animals"). Then the original answers of the respondents appear which are the premises from which the summary of the gestalt is deduced.

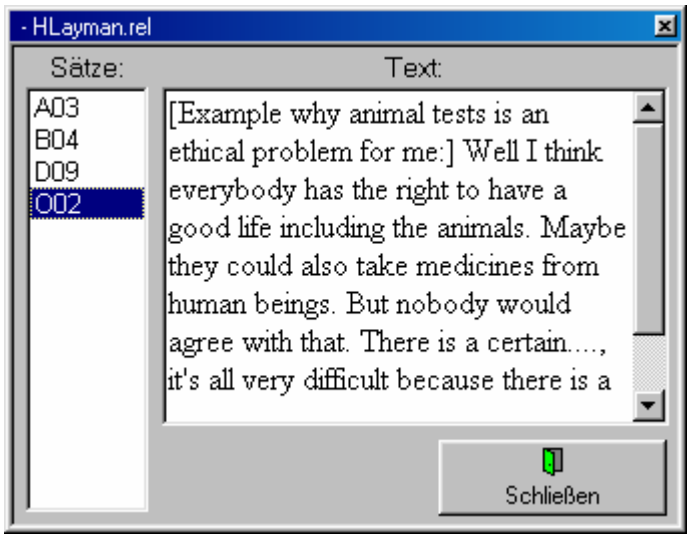


Fig. 15: Original answers which are summarized in the gestalt animals.

So the gestalten tree is to be understood as a deductive system of texts. Each level of texts supplies a more or less complex representation of the total situation. All summaries are formulated in the everyday-language of the respondents. This theoretically founded procedure makes it possible for the people concerned to find themselves within a complex opinion network and thus understand themselves and other people better. *Therefore GABEK is a learning procedure.*

In the GABEK procedure, a description of the phenomenon under investigation thus takes place on different levels of complexity. If the reader of a GABEK project report wants an overview of the results, he can look at the texts on the highest levels. If he however wants to have detailed answers to questions, he will go on to deeper levels. This is because each text of the different levels, except the level of the verbal data, is a summary which was created by the analyst in accordance with clearly defined rules and which can logically be derived from the texts on which they are based.

The order is a fractal one as all textgroups on all levels fulfil the same formal rules and the higher levels of the gestalten-tree refer to the same topics in a holistic guise as the lower ones.

We took *sentences* as relations between key expressions, *gestalten* as relations between sentences, *hypergestalten* as relations between gestalten etc. Each hypergestalt is then a formal net of nets of nets of key-concepts. Its nodal concepts are also concepts on all the lower levels. Therefore we obtain a selfsimilar structure.

The gestalten-tree is now our linguistic map[4]. Clicking on the names of gestalten, hypergestalten or hyperhypergestalten we get the summarizing texts. If we want an explanation of any topic we read the corresponding texts on the lower level. Thus by clicking on any field each text of the gestalten-tree can be explained by texts containing more details.

The highest statements are more general, the lowest more specific and complex. The highest texts further our understanding in many situations; the lowest are more informative for concrete problem solving and decision making.
The highest provide an overview of the whole and are networked in the wide linguistic context. They are interrelated with the complete verbal data base. The lowest show strong emotional loads. Therefore they are more interesting for motivation. According to the specific goals of data presentation we can switch from top down to bottom up.

7 The representation of assessments by evaluation lists

Normal linguistic texts first of all contain descriptions. Furthermore common language expressions contain prescriptive judgements, and thus value judgements and norms. In order to represent prescriptive judgements of a verbal database clearly, apart from the basic coding, evaluation coding is necessary. This requires that we arrange features, states, situations, actions, processes, which were evaluated positively or negatively by the respondents, in the form of lists.

In our example we will answer only the question: which real phenomena, attributes, states, situations, actions are expressed and how were they evaluated by the respondents?
Here we show parts of lists of exclusive positive, predominantly positive, exclusive negative and predominantly negative evaluations contained in the verbal data of patients.

The sign "+" indicates positive evaluations of actual objects, attributes, states, situations; the sign "-" negative ones. Neutral assessments are not displayed here. The indices on the right hand of the lists refer to the corresponding statements in the responses of patients. By click on any of them the corresponding original text appears. The relation between positive and negative evaluations shows that the topic "ethics in medicine" is judged as a serious problem

actual situation

[4] Rudolf Wille in his lecture "Conceptual Landscapes of Knowledge: A Pragmatic Paradigm of Conceptual Knowledge Processing" at the International Conference *Conceptual Knowledge Processing* (Darmstadt, february 1996) explained the chief scientific activities using the metaphor of a landscape with our activities in it (exploring, searching, recognizing, identifying, analyzing, investigating, deciding, improving, restructuring, memoryzing). As examples he pointed at various projects in the field of *Formal Concept Analysis*.

Positive

+	4	control_state	E15 H08 J04 J07
+	2	medicine_preventive	C01 F08
+	2	donation_of_organ	C06 C07
+	2	responsibility_state	S15 S16
+	2	communication	E09 P09
+	2	ethics_committee	J05 J07
+	2	med_point_of_view	F04 I02
+	2	private_hospital	G02 G08
+	2	euthanasia_active	F04 H04

Predominantly postive

+	10	state_restrictive	C10 D11 E14 E15 H08 I05 J05 K07 L09 S13
-	1	"	Q07
+	4	medics	F03 G02 G04 G08
-	3	"	E08 S01 S07
+	4	decision_doc	M06 S05 S08 S09
-	1	"	M05
+	3	restore_to_health	I04 J06 K06
-	2	"	H02 H10
+	2	contact_to_pat	E09 P09
-	1	"	E10
+	2	euthanasia_passive	T09 T11
-	1	"	Q02
+	2	guidelines	C10 H08
-	1	"	Q07
+	2	public_discussion	D11 P12
-	1	"	E02
+	2	treatment	E09 K06
-	1	"	E07

negative

-	13	interference_with_nature	A03 A04 A13 B04 H01 H02 H06 H07 H10 L02 R02 R03 T02
-	8	withhold_information	D05 E08 F05 J02 L05 M05 P07 R07
-	7	cloning	A03 A04 A13 B12 F01 S02 S03
-	7	coma_pat	T06 T07 T08 T09 T10 T11 T18
-	7	use_of_pat_for_research	H06 H09 L06 M01 M02 T03 T04
-	6	conflict_of_interests	C05 H03 H04 P06 Q02 S05
-	5	politicians	A11 F14 F15 F18 F19
-	5	gods_in_white	D06 O05 P09 R05 T14
-	5	ignorance_of_consequences	A04 B04 E14 F13 H07
-	4	medicine_repairing	C01 C02 C03 C11
-	4	advances_in_medicine	B08 L07 T01 T17
-	4	treatment_error	E04 E07 E08 E10
-	4	economy	B03 B11 S15 S16
-	4	animal_experiment	B04 B12 O01 O02
-	4	life_prolongation	I03 L07 L08 T18
-	4	lack_of_drugs	G01 G03 G09 G12
-	4	over-treatment	T02 T04 T06 T23
-	3	pollution	B09 B10 B11
-	3	dementia	A09 M02 M03
-	3	neglect_pat	H04 O04 T04
-	3	complaint	G03 G07 L08
-	3	time_pat_has_left	I04 T03 T05
-	3	interest_research	M01 T03 T04
-	3	operation	C01 C03 F16
-	3	troublesome_pat	G03 G04 G05

-	3	prenatal_diagnosis	H01 H10 K05
-	3	concealment_of_research	S02 S03 S12
-	3	perfect_man	F01 J01 L02
-	3	abortion	H01 H02 K05
-	3	technical_jargon	D05 D06 R07
-	3	raise_pat_hope	S10 T04 T14
-	3	experts	F17 T15 T16
-	3	doc_working_as_commercial_company	C08 F16 S01

predominantly negative

+	3	genetic_manipulation	B02 E16 K06
-	12	"	A03 A04 A13 B04 B08 B12 D08 J01 R01 R02 R03 S12
+	6	government	D11 H08 I05 S13 S15 S16
-	9	"	A11 B11 F14 K07 O09 O10 Q07 T19 T21
+	1	death	I03
-	2	"	E04 E06
+	1	legislation	E15
-	2	"	T19 T21
+	1	pat_desire	H04
-	2	"	S09 S10
+	1	refusal_to_fulfill_desire_of_pat	S09
-	2	"	C05 H04

Statistics

Evaluations overall:	595	100.0 %
of which Positive	105	17,6 %
of which negative	318	53,4 %
of which Neutral	172	28,9 %

Finally it should be added that in the interviews no particular evaluations were requested. Rather, all evaluations were expressed spontaneously by responses to open interview questions. The evaluation lists show values of Dutch patients at the time of the questionnaire which are related to ethical conflicts in medicine. These values may refer indirectly to their weltanschauung.

The evaluation lists are an interesting means to compare desires and concerns of different groups – maybe conflicting groups.

8 The representation of causal assumptions by network graphics.

Apart from descriptions and evaluations in normal language texts causal assumptions are also expressed. These are opinions on cause-effect connections, based on empirical experiences or discussions. We can also see the causal assumptions of the respondents as arguments for reasonable control of our actions.

In order to isolate causal assumptions from the verbal data, the electronically stored texts of each record sheet must be read again and coded in a new way. Expressions which are connected by causal relations are called causal variables or simply variables, since they refer to situations that are experienced as changeable. Of course causal analysis also depends particularly on the question of analysis.

Ordinarily we will ask the question: does the autor of the text believe that the growth of the variable A leads to the increase or decrease of the variable B? There are very different normal language statements applicable to such coding, e.g. quantitative relations (in the form of "the more A, the more B"), real relations between cause and effect ("A is a cause of B"), qualitative relations specification ("if A improved, then the quality of B would also increase"), statistical generalizations ("if A, then mostly also B" applies) and many others.

In addition we can distinguish between causal influences which have either a favourable or an unfavourable effect on another variable.

The analysis of causal assumptions leads to complex nets of opinions about influence relations, which can be used in new situations for orientation. A multiplicity of executed projects showed that causal networks which represent hypothetical relations contribute substantially to preparing decision planning in new situations[5].

Besides, a colour can be assigned to each variable in the causal expression list Different colours will be assigned to basic values, main goals, subordinate goals, measures, or invariable basic conditions. There are guidelines for this procedure. But the distinction between intrinsic basic values and main goals, lower goals or measures is made by the analyst.

In our project ethical values were coded in blue, ethical conflicts or problems which may also express aims grey, goals in green, measures in yellow and conditions which cannot be changed in bright yellow.

---

5 In addition, this type of coding of relations, which we mostly use for the representation of causal opinions, can also be used for other purposes. Principally one can represent each type of two-place relations, e.g. communication relations between departments of an organization or between individuals. Instead of causal variables only names of persons or of departments would be used between which a communication relation of a certain type is assumed, for example when it is being said that there are business relations between two organizations or cooperation relations between individuals.
Furthermore, process plans, for which temporally arranged relations between operations, prerequisites of operations and results of operations are being coded, can be represented on the basis of experiences of employees.

Now causal assumptions can be plotted in the subprogram *Causal net graphs* automatically. E.g. one can select a variable, for instance problem_future and ask which other variables would influence (ethical) problems for the future.

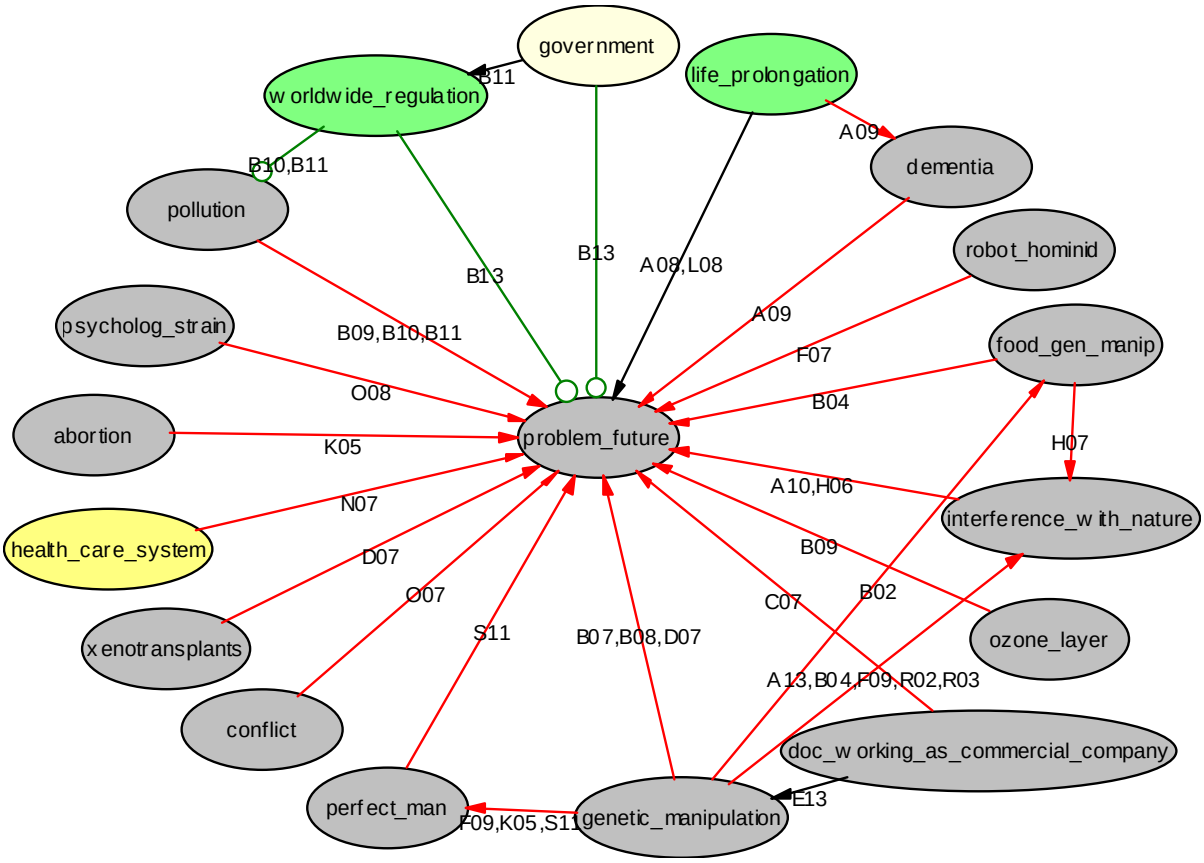


Fig. 16: Influence variables on problems_future *according the patients*

We see that almost only unfavorable influences are presented (red arrows). Besides three black arrows (influences considered ambivalent) the patients express only worldwide regulations and the government which could reduce problems in the future (green lines with a small circle).
To reduce complexity in the causal network too we can draw only those arrows which are supported by at least two (or more) text units. If we define the minimum number of sentences as 2 then the following fig. 18 results:

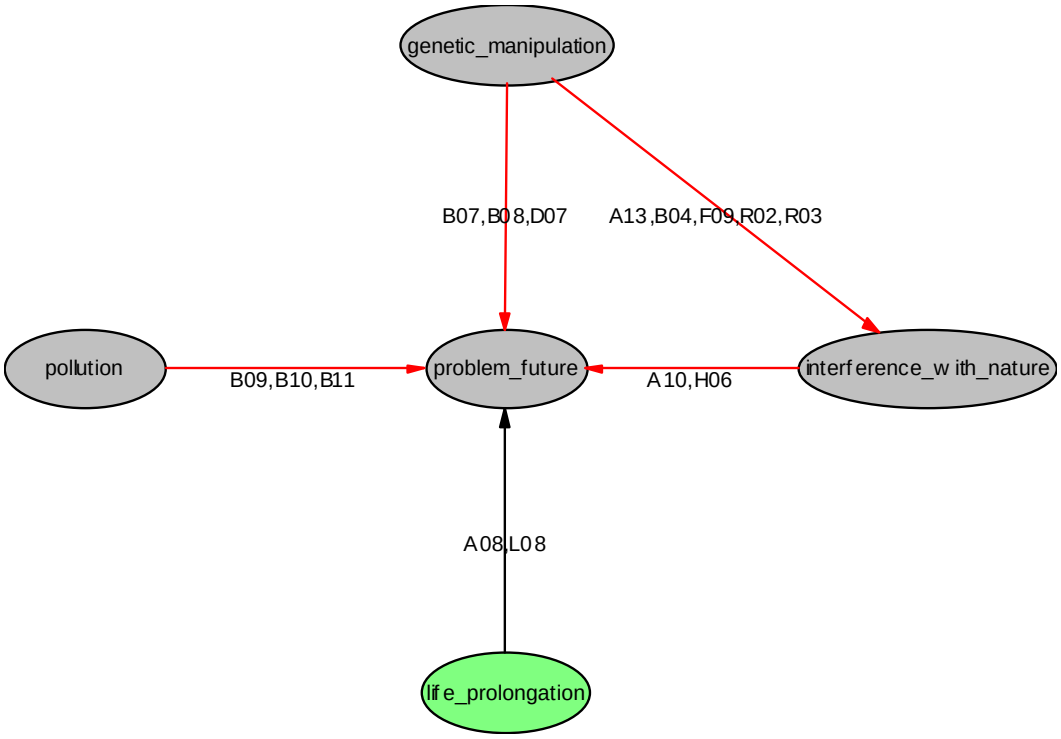


Fig. 17: Influence relations on problems_future *according the patients, founded on at least two texts.* Pollution, genetic manipulation *and as a effect of this interference with nature leads to more* problems in the future, *which is assessed as negative (red arrows). Beside this* life prolongation *can also lead to* problems in the future *which is seen as an ambivalent influence (black arrow).*

As in the linguistic network we can also navigate through the whole net in order to enlarge the graph.

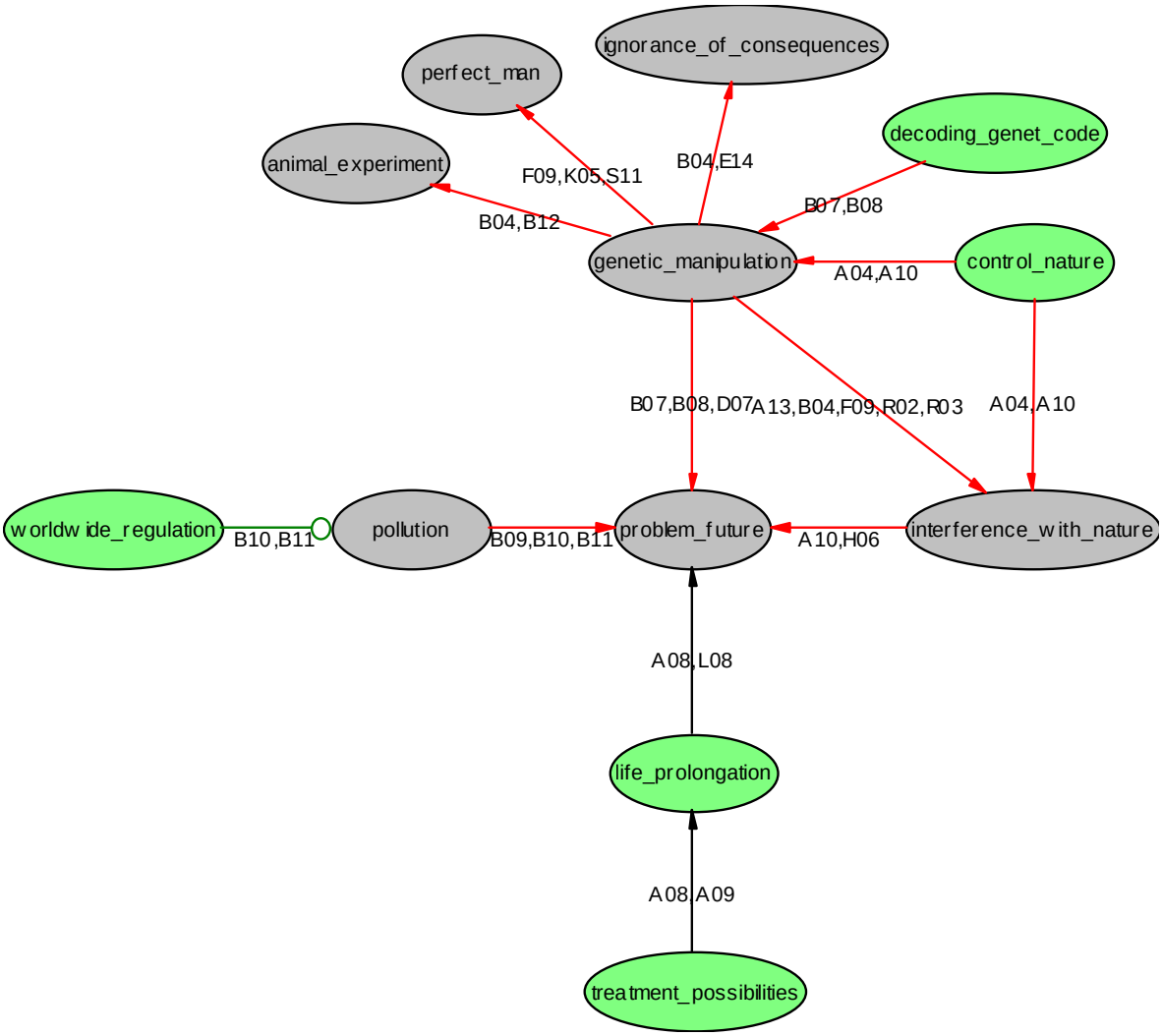


Fig. 18: A larger causal net based on the variable problems_future *where each causal assumption is supported by at least two text units. Here we also see a positive influence relation in green colour.* World wide regulations *can reduce* pollution *(where the reduction of the variables is indicated by a small circle).*

Besides proceeding from problems (*problem future*) to their assumed causes (see above) we can also take the reverse path and proceed from measures to their assumed consequences. So we can ask how the government may influence the situation:

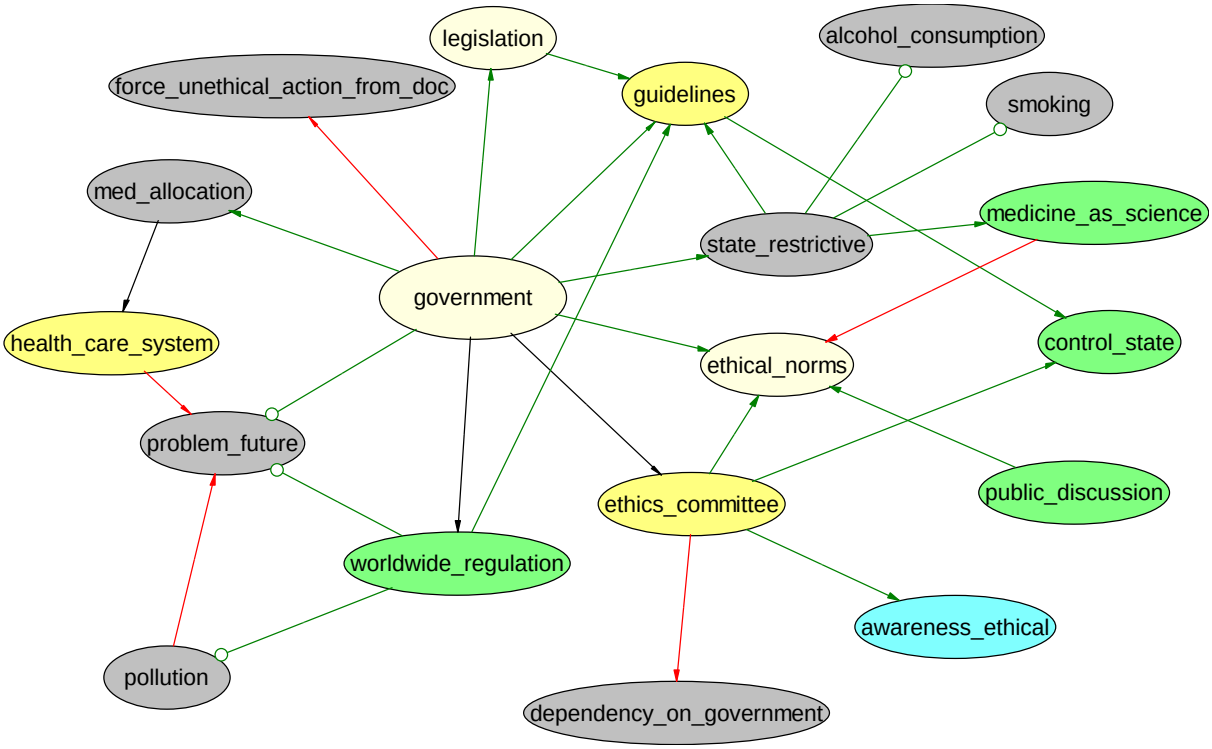


Fig. 19: Possible influences by the government *are predominantly positive*

Each assumed causal relationship is supported by texts. By clicking on the PC the connecting arrows with the right mouse key one can immediately read the texts in which the causal assumption was expressed. Graphs as well as texts can easily be transferred and printed out in Word.

9 The representation of the order of cognitive relevance

We have already come across an abundance of different results. But now the question arises which topics are really important from the view of the respondents. Which results have to be considered under any circumstance? If we want to know what is particularly important and relevant to those concerned, then GABEK supplies unique results. We use three criteria for weighting the topics :

A topic A is judged more relevant than a topic B if A reaches a higher level in the gestalten tree. The reason for this criterium is that results on higher levels (hyperhypergestalten or hypergestalten) are applicable in more cases than results on lower ones (gestalten or responses).

A topic A is judged more relevant than a topic B if A is evaluated more often by the respondents as positive or negative than B.

A topic A is judged more relevant than a topic B if A is embedded in more causal relations than B. I.e. if A has more effects or is influenced by more causes than B.

A topic which ranks high on all the three criteria is certainly very important in the minds of the respondents.
From this a relevance list is generated, which indicates at a glance which addressed ranges of topics are of special interest to the persons concerned (viz. Zelger 1999c, 2000a).

We open the subprogram *Relevance Analysis*  and obtain a list with 5 areas, whereby the highest level of the gestalten tree in which the key concept or topic still occurs is indicated in the 1st column (blue). In the 2nd Column (white) the appropriate term is displayed; in the 3rd to 6th column (green) the number of the positive and negative evaluations is mentioned; in the columns 7 to 9 (red) the number of causal relations and finally, in the last column the assigned colours (color coding) are pointed out.

Relevance list

Gestalt	Expression	List of.eval.		Eval.	Causal relations			Color
Level		+	–	Sum	–›o	o–›	Sum	
HH	genetic_manipulation	3	12	**19**	7	11	**18**	
HH	government	6	9	**18**	2	9	**11**	
HH	interference_with_nature		13	**16**	10	3	**13**	
HH	state_restrictive	10	1	**15**	1	4	**5**	
HH	information	1		**11**		2	**2**	
HH	withhold_information		8	**9**	2	4	**6**	
G	medics	4	3	**8**			**0**	
HH	paternalism	4	4	**8**	1	2	**3**	
G	cloning		7	**7**	3	4	**7**	
S	coma_pat		7	**7**			**0**	
S	euthanasia		2	**7**	2	1	**3**	
HH	med_research	2	2	**7**	1	4	**5**	
G	use_of_pat_for_research		7	**7**	4	1	**5**	
HH	conflict_of_interests		6	**6**	5	1	**6**	
G	ethical_limits	1		**6**	1		**1**	
HH	euthanasia_active	2		**6**	1	2	**3**	
S	euthanasia_passive	2	1	**6**			**0**	
G	guidelines	2	1	**6**	4	1	**5**	
HH	life_prolongation		4	**6**	1	4	**5**	
S	life-death		2	**6**			**0**	
HH	public_discussion	2	1	**6**	2	1	**3**	
HH	autonomy	1		**5**	1		**1**	
HH	decision_doc	4	1	**5**	2		**2**	
HH	financial_support			**5**		2	**2**	
S	gods_in_white		5	**5**		1	**1**	
HH	ignorance_of_consequences		5	**5**	5		**5**	
S	medicine_preventive	2		**5**		7	**7**	
S	politicians		5	**5**		3	**3**	
G	restore_to_health	3	2	**5**	3		**3**	
HH	advances_in_medicine		4	**4**	2	4	**6**	
G	animal_experiment		4	**4**	1	4	**5**	
G	communication	2		**4**	1		**1**	
S	complaint		3	**4**			**0**	
HH	control_state	4		**4**	2	1	**3**	

Fig. 20: The list of relevance for patients

Operations of selection

The list can be reduced according different keys as can be seen in fig. 21. It can be ordered according to the frequencies of the evaluations listed (Bewertungen), the causal listing (Kausalliste) or alphabetically (alphabetisch). Each option must be confirmed by ↵. In the case of more than one evaluation list further selection options appear. Both the causal list as well as the evaluation list can be swiched off. The values can also be displayed in percent in order to be compared with other project results.

When we click on „*select colour*“ and we choose e.g. *blue* then according to our colour coding we receive the values expressed by the respondents (as blue is reserved for fundamental values).

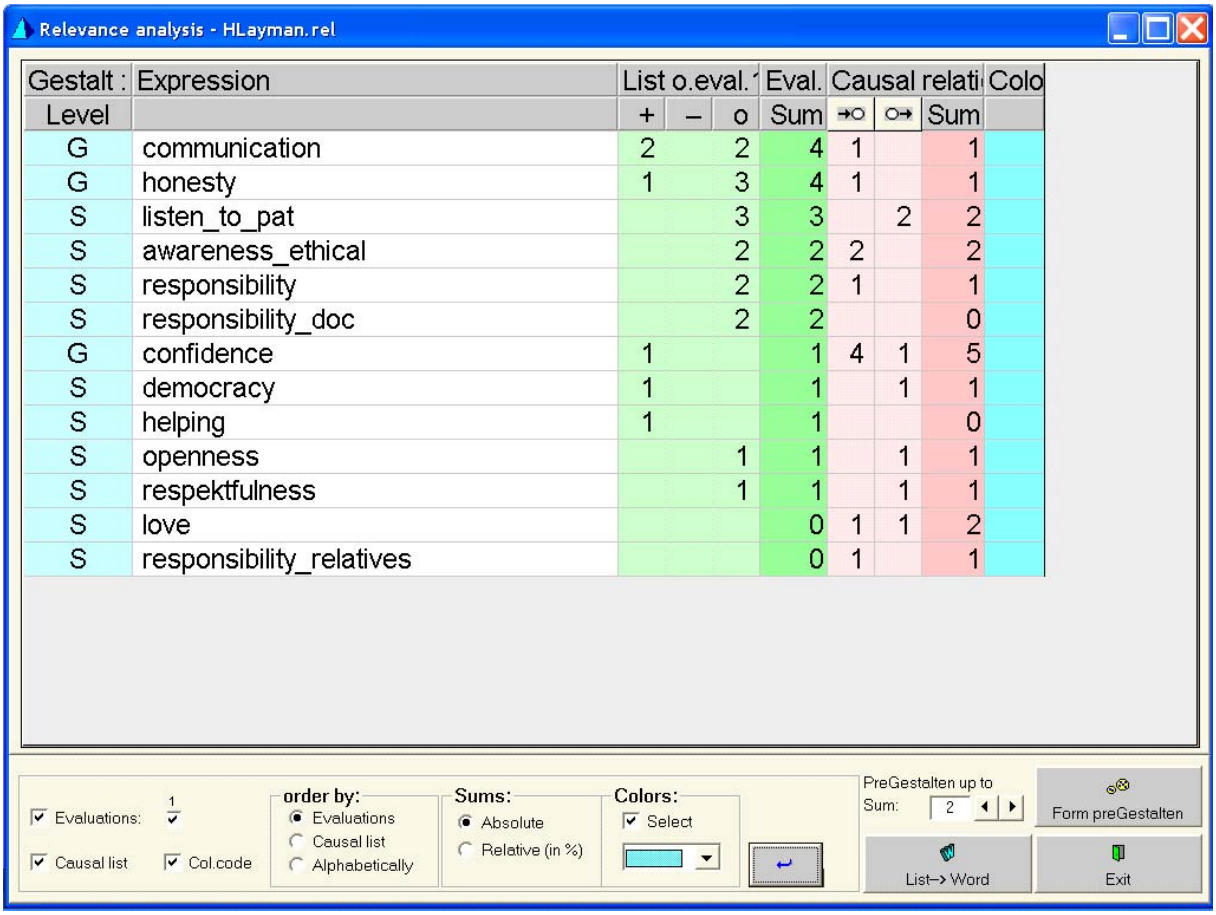


Fig. 21: Fundamental values of patients ordered according the number of evaluations

In the same way we also can select higher aims, goals, measures or fundamental conditions which can be ordered according to our relevancy criteria.

So basic values or main goals, for example, can be selected and represented in *WinRelan* separately (As it is shown in fig. 21).
Basic values are important for the development of mission statements and for orientation purposes, main goals serve for the basic adjustment and justification of projects and intermediate objectives and measures are needed for their concrete implementation.

10 Representation of the emotional relevance

Of course the three criteria of relevance (chapter 9) don't include all aspects of relevance. Besides these cognitive perspectives the emotinal load of verbal expressions has to be taken into account. So we ask the question how we can represent the mood in which the responses were given.

To analyze the emotional load of the statements [cf. De Mause 1979, Tafertshofer & Zelger 1982] a special kind of fundamental coding is required (cf. chapter 2). We must include as key terms both the emotionally loaded expressions, symbols, metaphors, body language expressions as well as unexpected special and unusual concepts. On the other site we don't pay any attention on the rational content which very often hides the emotional one of the statements. Especially we omitt all the logical operators. As emotional feelings do not have negations we don't take the negations into account. (According to Freud the unconsciousness also has no negation: thus if I say: "I do not want to talk about violence", then on the emotional level I still enter the topic "violence".) Further we don't pay attention at all the abstract terms which designate ideals or theoretical constructs.

Drawing of emotional graphs

After such an emotion coding we start the subprogram *linguistic network*  . In the expression list we select a concept for which we want to display the emotional connotations. Let us choose *medics* (physicians). It is the perspective under which we look at emotions and feelings connected to it. Then we don't display the expressions very often connected to "medics" as we did in the association graph in order to determine contextual meaning of the term. Here we do something different. We select only the emotionaly loaded terms connected to our key term "medics". Most of them occur only once or few times as emotional feelings often are hidden in ordinary language texts. Then of "medics" the following expressions appear in the proximity of the term.

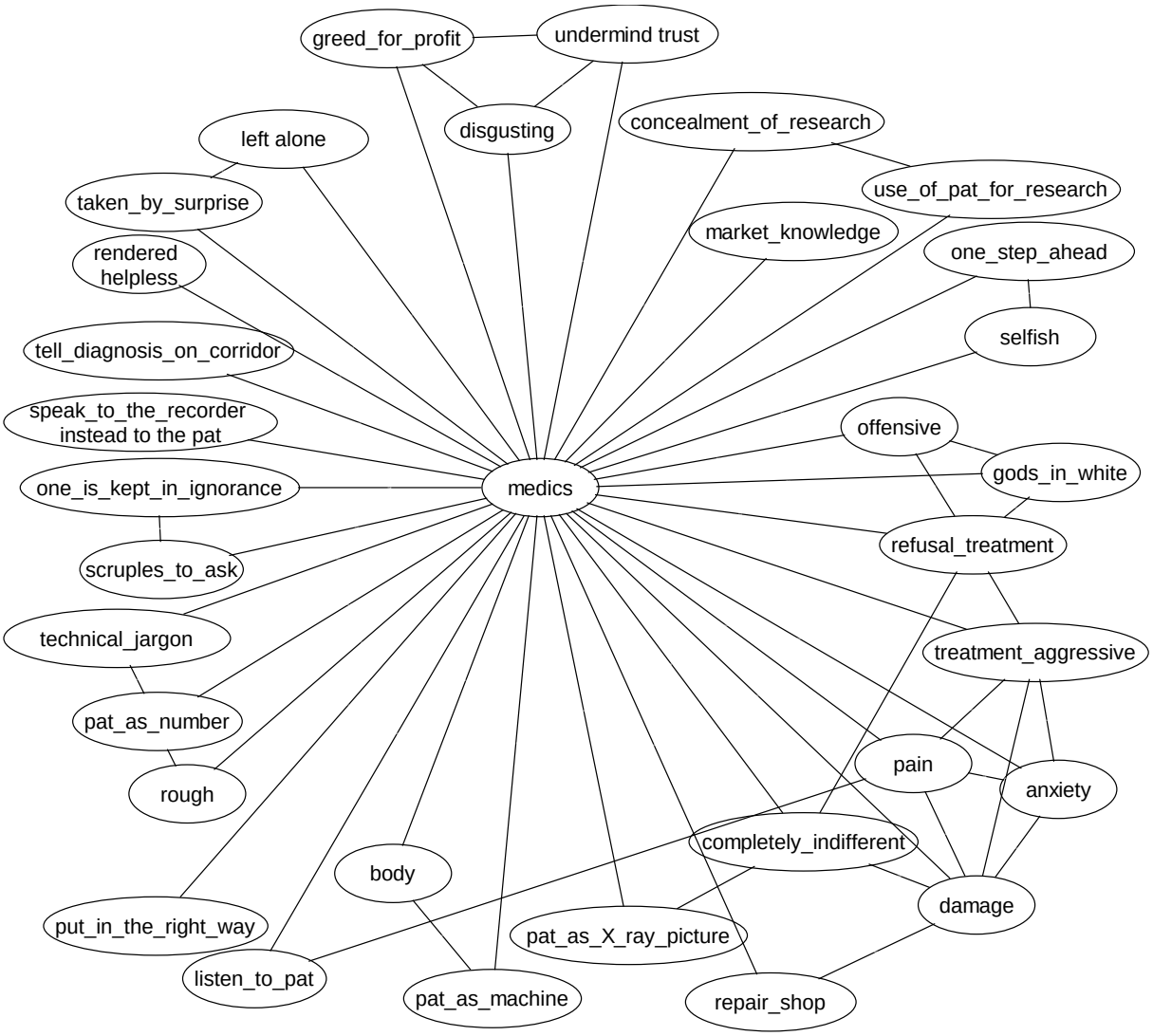


Fig. 22: The emotional graph of Austrian[6] patients in the perspective of "medics". It shows topics which ordinarily are not discussed in an explicit way but still can be detected by a deep analysis of the texts.

To compare the results of the emotional graph (fig. 22) with the corresponding association graph we display this in figure 23. Here only those terms are shown which are connected with "medics" at least 5 times.

[6] The emotional analysis must be executed using the authentic original text. Now I don't understand Dutch and the English translation of the dutch texts would change too much of the emotional content. Therefore the example of fig. 22 is taken from the Austrian part of the project where interviews were conducted in German. Only after the emotional analysis were the concepts translated into English.

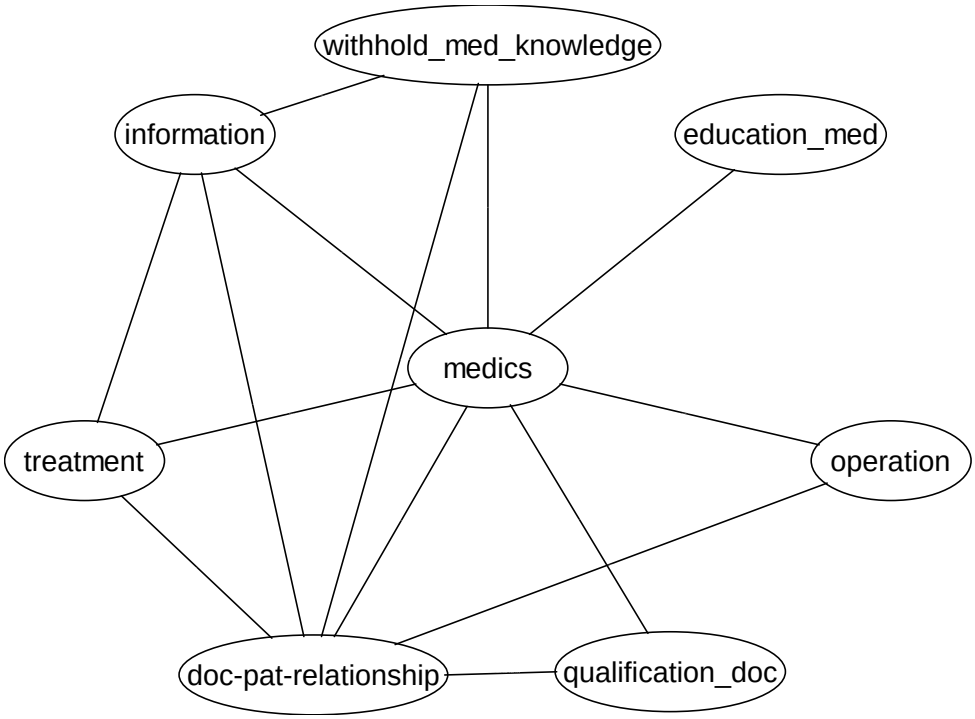


Fig. 23: Association graph of Austrian patients for "medics". It shows the topics which are explicitly discussed by many respondents.

We see that the graph of figure 22 has no one term in common with that of figure 23. In the emotional graph fig. 22 to "medics" we find groups of interconnected emotionaly loaded terms which express much more negative than positive emotions.

We assume that emotional feelings of the respondents are also perceived in ordinary communication although not fully consciously. For problem solving this is relevant due to the motivating role of emotions. They move to reactions, to measures and action. So, in judging the relevance of proposals not only the cognitive perspective should be taken into account but also the emotional one.

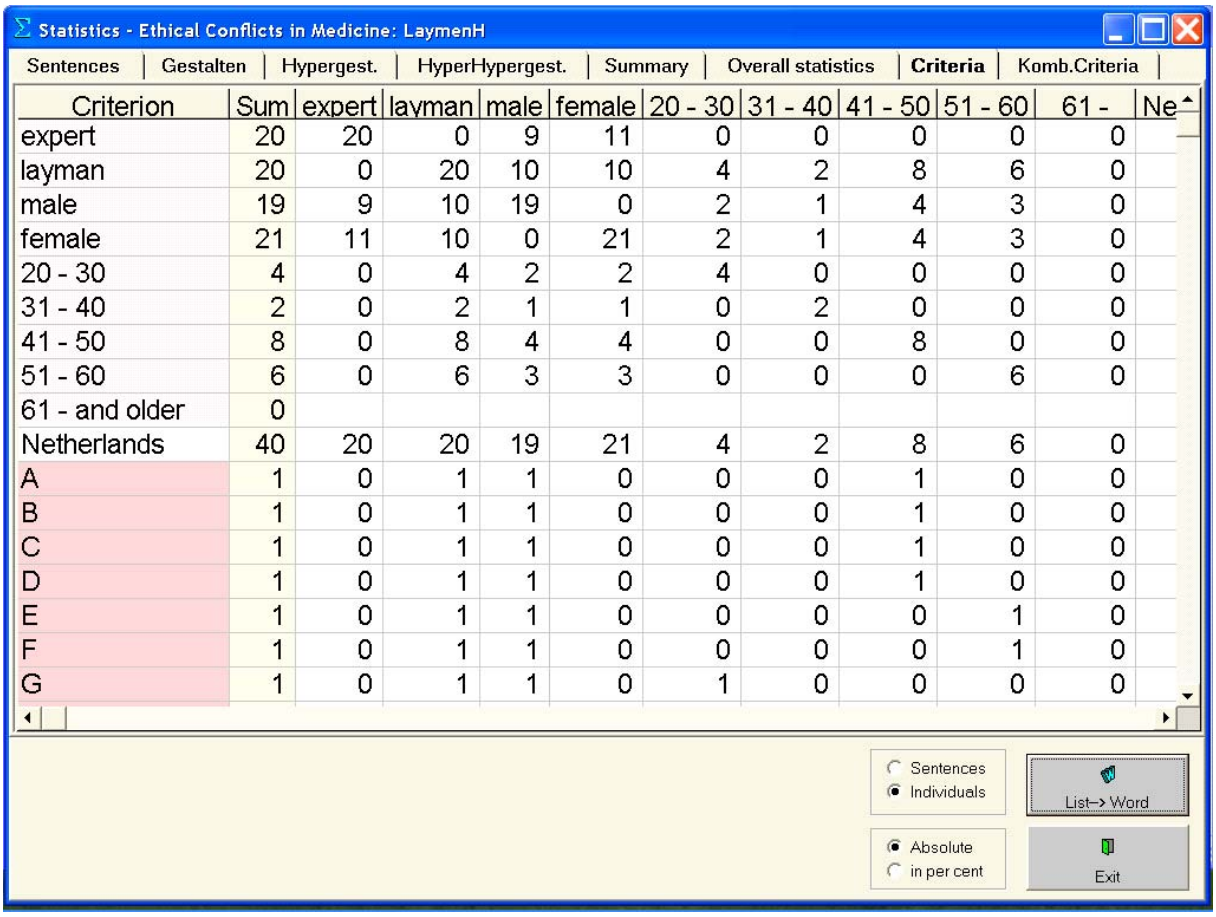
11 Representation of statistical frequentnesses

GABEK distinguishes two basic ways of coding: apart from the object-linguistic coding mentioned above, through which the lexically relevant terms are identified, there is the possibility of meta-linguistic coding (as used in other qualitative data analysis software systems).The latter clearly stands out against object-linguistic coding, since relevant criteria or categories which do not have to occur in the text, are assigned to the text by the researcher. These can be:

1. Text-related criteria: These are categories to which contents of a text unit are attributed. Examples of text-related criteria could be: arguments in favour of a measure, arguments

against it, economic perspectives, technical features, definitions, theoretical concepts, examples, individual cases etc.
2. Names of individuals: These refer to the individuals who formulated the text unit (generally anonymously) and were interviewed.
3. Criteria related to individuals: Finally there is the possibility of assigning features to the individuals e.g. age, sex, education, vocational qualification, etc..
Thus sections of verbal data can be selected or combined arbitrarily according to the criteria - be it raw data or data already processed - and statistics can be produced.

The meta-linguistic coding of all text units permits in the subprogram *Statistics* a direct analysis of the frequencies for all pairs of criteria or for any combinations of criteria, either in absolute values or in percent. The frequencies can refer to persons or records. In the following illustration 24 we refer the specification to persons in absolut values. For this we load the merged document of patients and experts. But in this case we cannot find interesting differences, which would suggest analyzing parts of the data separately as there are no interesting criteria to apply.
In other cases, by representing statistical frequencies WinRelan offers an instrument which supports the analysis of different verbal data separately or in one.



Criterion	Sum	expert	layman	male	female	20 - 30	31 - 40	41 - 50	51 - 60	61 -	Ne
expert	20	20	0	9	11	0	0	0	0	0	
layman	20	0	20	10	10	4	2	8	6	0	
male	19	9	10	19	0	2	1	4	3	0	
female	21	11	10	0	21	2	1	4	3	0	
20 - 30	4	0	4	2	2	4	0	0	0	0	
31 - 40	2	0	2	1	1	0	2	0	0	0	
41 - 50	8	0	8	4	4	0	0	8	0	0	
51 - 60	6	0	6	3	3	0	0	0	6	0	
61 - and older	0										
Netherlands	40	20	20	19	21	4	2	8	6	0	
A	1	0	1	1	0	0	0	1	0	0	
B	1	0	1	1	0	0	0	1	0	0	
C	1	0	1	1	0	0	0	1	0	0	
D	1	0	1	1	0	0	0	1	0	0	
E	1	0	1	1	0	0	0	0	1	0	
F	1	0	1	1	0	0	0	0	1	0	
G	1	0	1	1	0	1	0	0	0	0	

Fig. 24: Statistical frequency specifications concerning persons in absoluet values. It refers to the merged documents of patients and experts.

12 The simulation of dialogues

Of course different groups of individuals can hold very different opinions. We will now see how these opinions of opposite groups can be compared.

The sub-program *project comparison*  presupposes that a database or several verbal data records have already been analysed in the form of *gestalten trees.* If this has been done, the program can serve many different functions. It can be applied to look up texts that are *comparable, similar, opposite or contradictory to a determined text unit.* It can be used as *a learning tool i.e. a tutorial*, for example, when a young employee is to be introduced fast and effectively to habits, experiences, or the linguistic usage of an enterprise or of a branch far away from the headquarters. The program is also suitable for the *introduction to a complex theory* of the humanities or social studies, or it can be used as a program for the innovative and unusual *linkage of ideas*. However, the *simulation of dialogues* and the associated management of *conflicts between groups* is intended as the core application of the program *project comparison*. (For the theory of the dialogue see Zelger 2000b).

For this we load the projects of the conflicting groups A and B next to each other into the sub-program "project comparison". For each project three fields are available on the display. In the first field the gestalten tree emerges which can be more or less unfolded. It covers the whole knowledge that is available about the group A, in the sense of "tacit knowledge". If one opens the gestalten tree and selects a text—on any level of the gestalten-tree —, the key terms of the selected text appear in a second field. They represent the "focus of our attention," that is our conscious contents at the given point in time. Simultaneously, the appropriate text, which contains the key terms, appears in the third field as a product of the basic knowledge (tacit knowledge) and of the (conscious) key terms.

If we want to react to a preceding text of the group A with a text of the group B, this cannot take place arbitrarily. Rather, a response should contain some key terms that were used in the text of A. Therefore, we define the "area of possible linguistic reactions in relation to a preceding text" as that part of a gestalten tree in which only texts occur that have at least one term in common with the preceding statement.

A small dialogue between patients (group A on the left side) and experts (group B on the right) runs as follows:

Group A: patients	**Group B: experts**
interference_with_nature	U85
An important ethical problem in medical science are the ethical limits to interfering in the natural development and its reproduction which will become a bigger problem in the future. Modern technology replaces nature, for example genetic manipulation of embrios (deciding of their characteristics), of human beings or of food. The question is how far man can interfere with life and nature (to not destroy the balance in nature).	I think there will be [ethical] problems [in the future] regarding reproduction; selection of genetic material to bring people into the world with as few deficiencies as possible or reproduction totally without the need for a man or woman; turning genetic material into people. That would be, I would think, an unethical use of genetic material [because] I think that is too much interference with nature.

perfect_man

One of the ethical problems in the future by genetic manipulation is cloning. People are trying to be smarter than God and they'll try to make their image more beautiful than it already is - a perfect man.

Genetic_Engineering

An important ethical problem in the future in medical science, through new technologies and genetic engineering, will be cloning (for example cloning and implanting embryonic cells or reproducing of your own cells) of human beings. The question is if this will be an unethical use of genetic material or not.

The dialogue – produced almost automatically – begins with the summary "interference with nature" of group A. As a first answer an original response U85 of an expert is found in the "area of possible reactions in relation of the preceding text" of group B. Then the dialogue continues by gestalten of the groups A and B. The connection of the 4 texts as in fig. 25 shows that the connection of the 4 texts fulfils the rules of our chapter 5.

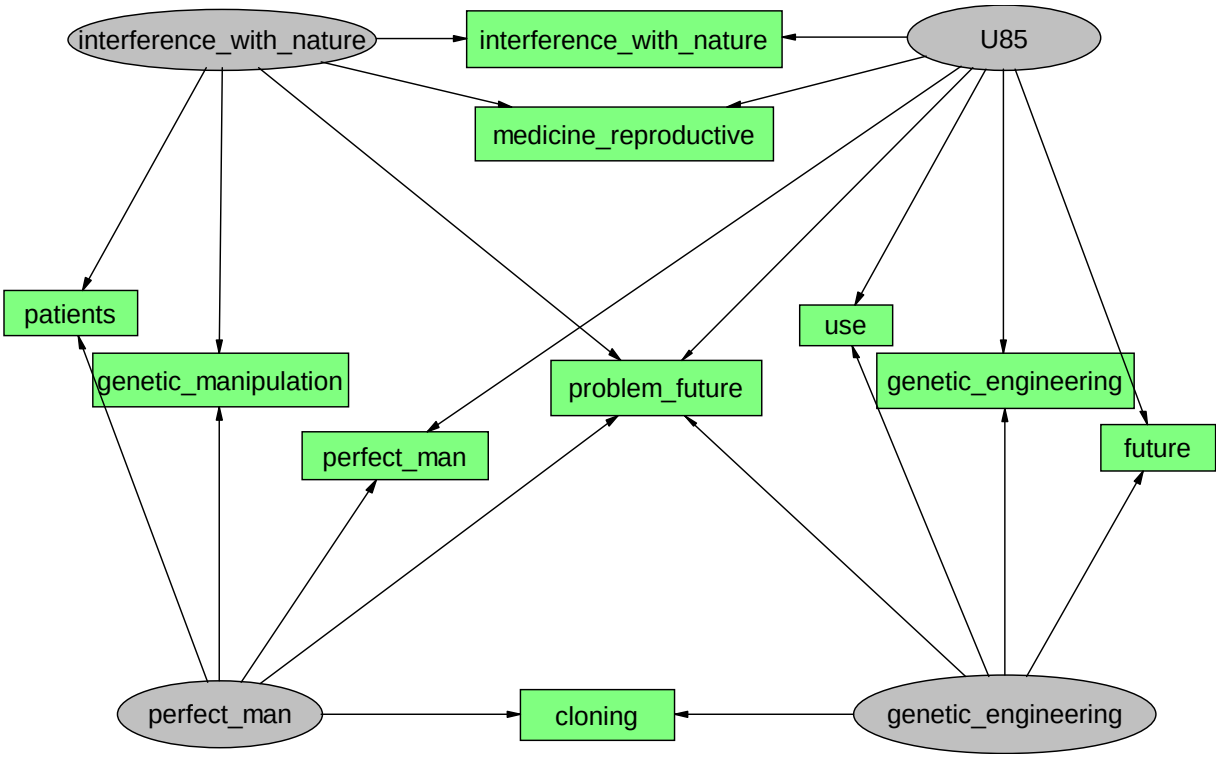


Fig. 25: The connection of the simulated dialogue with 4 statements builds a new linguistic gestalt.

According to our rules of chapter 5 we form the summary:
For the future ethical problems are expected as effects of genetic engineering and cloning, where reproductive techniques of medicine are used to form the perfect man. This will interfere with the natural development and is assessed as an unethical use of genetic material of patients.

The summary together with the 4 texts result as a new linguistic gestalt.

The summary of the text units connected to a gestalt as result of the dialogue is then the content which was learned by the two dialogue partners. I believe that dialogue is always the basic form of learning. With the software *WinRelan* GABEK offers a procedure by which it is

possible to simulate dialogues also for people who cannot meet each other or who are not prepared to come together. GABEK can be seen as an instrument to initiate real dialogues too.

As experience shows, even in opposing groups there are often contents on which they agree. This is emphasized when striving for conflict resolution. Such discussions can be summarized as a consensual result according to the rules of the linguistic gestalt formation (Zelger 1999a, 1999b).

Basically, when there are conflicts between two groups, each group will at first be presented with their own results. In a second step one will demonstrate the points of agreement of both parties. It is not until later that one would also try to show each party the opinions and arguments of the other party, so that they learn to understand each other mutually. Such procedures have already contributed to conflict resolutions in difficult situations [examples see in Pothas & De Wet 1999, Zelger 1999c].

Conclusion

In conclusion I would like to cite a few sample projects to indicate the variety of applications of GABEK.

GABEK has been used for evaluation purposes (of the Italian Ground School Reform in South Tyrol), for quality control (in a hospital), for product evaluation (of vehicles), conflict resolution (in South African Industries); furthermore there have been projects on goal development (of a university), minority research (in South Tyrol) and town research (Tepito in Mexico City). Acceptance research in Georgia, Holland and Germany, intercultural management in Thailand, China, Brazil, Europe and market research in South Africa and Austria have also belonged to the standard applications. Projects on organizational and staff development and innovation research are also in the core research area of GABEK. Finally, there were a number of projects on medical ethics, clinical psychology, sports medicine, school didactics for different fields, personality psychology and research on marginal groups

Summarising, we recommend for complex problem situations not to proceed by deciding on certain suggestions but to use the experience of all the colleagues and some of those affected and to ask them about the situation. Only after this step should the problem be developed by experts. Planning thus becomes easier. Due to the simple method of obtaining information (some open-ended questions) and the relatively few hours of expert advice the expenses incurred with GABEK are less than those of conventional methods. The great advantage lies not only in the holistic and more comprehensive view of the situation and the more realistic evaluation of the consequences, but also that those affected are included in the planning process, whether they are municipalities, offices or people in business. The possibilitiy of introducing authentic opinions is taken seriously. A plan is justified by authentic quotations by colleagues and others affected. Many individuals are able to identify with the plans and are therefore ready to support their realization.

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