

BUREAU DE  
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INFORMATION AND PRESS

**ORGANISATION DU TRAITE DE  
L'ATLANTIQUE NORD NORTH  
ATLANTIC TREATY ORGANIZATION  
B-1 110 BRUSSELS**

**MANFRED WORNER Research Fellowship-2000**

**INTELLECTUAL MODELLING OF INFORMATION  
MANAGEMENT OF POLITICAL MENTALITY  
DYNAMICS OF SOCIAL UKRAINIAN  
STRATA TOWARDS NATO**

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## ABSTRACT

The report describes the results of the research concerning the specifics of NATO image presentation by Ukrainian mass media and its connection with the dynamics of the population's attitude to the Alliance.

The research covers the period of since 1996 till the end of 2001, and was performed in an interdisciplinary framework including methods of sociology, cognitive psychology, mathematical statistics and artificial intelligence.

The informational domain of Ukraine - including TV, radio and press - was studied with the method of content-analysis of certain semantic and psychological categories including anchor-constructs, which were based on Maslow's theory human needs.

It was discovered that one of the main reasons of increase in negative attitude to NATO, that have taken place during last years, is the failure of Ukrainian government informational policy having been intended to facilitate the integration with NATO processes.

Basing on the results of the research a new model of information policy was suggested for Ukrainian mass media. The model stresses the democratic essence of European values and their connection with political institutions and economic achievements of modern Europe as well as NATO role as a defender of European democracy.

For building logical and mathematical model of the influence of informational domain on the population of Ukraine, we distinguished fifty-four social strata, basing on cluster analysis of demographic variables. The strata were distinguished according to the similarity of their mental values. The dynamics of strata was studied with the methods of sociology and cognitive psychology. Special attention was paid for the strata that are the most important for informational management, e.g. the largest, the most dynamic ones, the strata with the greatest part of ambivalent members, etc.

The political and economical factors revealed explains the strata dynamics with a set of simple cause-sequence relations, which formed a knowledge base for the expert system that computationally models mass media influence on population.

The method of regressive analysis of formalized informational flows and corresponding attitude dynamics in the strata allows calculating  $\beta$ -coefficients for approximate quantitative estimation of the mass media influence on the latter.

Direct and indirect inference methods combined with methods of mathematical statistics formed the inference apparatus of the expert system. The system is able to explain and quantitatively estimate public opinion dynamics for known informational flows and vice versa to calculate informational flows necessary for the desirable opinion dynamics.

Further refinement of the theoretical model and the expert system will be continued in M. Sc. and Ph. D. thesis of the students and researchers of National Technical University "Kharkov Polytechnic Institute".

The proposals for improvement of informational policy of Ukrainian mass media were sent to the Office for Public Relation of the Administration of the President of Ukraine, to the Parliament Committee on Liberty of Speech and Information, to the editorial boards of the most popular mass media and to the most influential politicians.

Several scientific papers will be published describing main results of the project.

## INTRODUCTION

### *The historical roots of Ukrainian mentality*

To understand the essence of controversial processes currently taking place in Ukraine at least a short excursion into its recent history is necessary. Ukraine became an independent state after the collapse of the USSR in 1991. The mentality of Ukrainians differs from that of Russians although these two peoples have had common historical roots since "Kyivska Rus" (9-12<sup>th</sup> century). In its development, Moscow state followed the organization of Golden Horde with its rigid hierarchical state system the head of which was appointed by Mongolian Khan. Personal faithfulness, not professional qualities, was favoured there when selecting people for ruling elite and the state apparatus. Ukrainians did not have any kind of statehood at that time and their historical territories partially constituted Grand Duchy Lithuania and later Rzeczpospolita. Due to these historical circumstances, Ukrainians mentality is initially more Western by nature with a strong democratic character mostly evident in the history Ukrainian Cossacks, having formed a kind of Military Republic with the centre at Zaporizhska Sich. Eastern tradition introduction to Ukrainian mentality began in 17<sup>th</sup> century when Ukrainians, warring against Poland for their independence, had to form a union with Russia. The union was facilitated by common historical root and common orthodoxy Christian religion inherited from Byzantium.

The greatest impact of the eastern totalitarian tradition on Ukrainian mentality was observed during Soviet period. "Russian communism" - an antagonistic symbiosis of Marxism and Russian populism - became the ideological force of the Russian State. Totalitarian content of this ideology matched historical logics of the Eastern tradition<sup>1</sup>. Lenin's basic idea was to build communism by means of "proletariat dictatorship", which was regarded as dictatorship of Communist Party<sup>2</sup> because proletariat in Russia was too small in the beginning of the 20<sup>th</sup> century.

Stalin turned the dictatorship of Communist Party into dictatorship of a single leader. In its political essence it was *Class Fascism*<sup>3</sup> which exterminated millions of people according to class attribute; as well as national fascism it was characterized by total state control in all spheres of social life: from ideology to economy. The huge propagandistic machine serving Soviet totalitarian ideology covered all strata of the society<sup>4</sup> smoothing out mental differences among the nationalities

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<sup>1</sup> Berdyaev N. (1992): "Sources and Sense of Russian Communism", M: Nauka , pp.38.

<sup>2</sup> Lenin V. (1902): "What Have to Be Done", Stuttgart.

<sup>3</sup> Yushchenko A. (1990): "A Report of a Non-Party Marxist on a Party Meeting", Leninska Zmina, #32-33, March 17.

<sup>4</sup> Turchin, V. (1981): "The Inertia of Fear and the Scientific Worldview" (Columbia University Press, New York).

of the USSR and forming "Soviet people" - something that was claimed to be a new uniform social community. Evident success of industrialization, economic growth, total literacy education, elementary public health service maintenance and other social achievements stimulated the majority of ordinary people to accept the ruling ideology with enthusiasm. Nevertheless, it was "Saturn devouring his child" - a state whose development was based on killing and humiliating such a significant part of its citizens.

Later on, the overthrow of Khrushchev by the party bureaucrats became a kind of a landmark showing that Soviet state finally transformed into a regime where the ruling class is the party bureaucracy. To strengthen its power and disguise its privileged status the bureaucracy continued exploiting old communist ideology despite the growing discrepancy between the ideology and the real life in the country. The specifics of a bureaucrat's status were that on leaving his position he used to lose all his power, privileges and the property he had controlled. Therefore, the bureaucracy and the rest of Soviet people approached Gorbachev's Perestroika with different interests. The former wished to establish their rights of the property they previously had owned only on temporal basis. The latter demanded social equality and democracy.

As a result of so-called "sovereignty parade" during the short period of time a number of new independent states emerged on the territory of the former USSR. Ukraine was one of them. In these states, the former Soviet bureaucracy constituted the skeleton of new oligarchic authorities owing now the major part of the former state property obtained from doubtful operations during privatisation. A Western analyst would hardly understand the processes taking place in the former Soviet republics, if he did not pay attention to the main contradiction of the so-called "democratic reforms" claimed there. The fact is that these reforms were just a disguise that certain social groups, which, in fact, strongly adhere to totalitarian ideology and have been the most anti-democratic part of the Soviet society, use for their appropriation of the former state property. As a result, the so-called democracy in modern Ukraine is actually "a ruling of business and political elite, and so-called market economy is actually the absence of any control on financial flows and business activity of enterprises..."<sup>1</sup>.

***The plundering of national property by Ukrainian oligarchic clans may provoke a new social cataclysm which, taking into account that the totalitarian historical traditions introduced during the long period of the Russian statehood are still alive in Ukrainian mentality, may result in establishment of new totalitarian regime.***

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<sup>1</sup> Marchuk E. (1999): "The Five Years of Ukrainian Tragedy", Kiev.

The process of gradual development of real democratic organization of the society is an alternative scenario. ***Integration to European structures (including NATO) would favour this process.***

However, the totalitarian traditions of Ukrainian establishment are still powerful. The democratic circles in Ukraine as well as abroad should understand that. This factor, for example, explains the resignation of Victor Yushchenko's Cabinet that had managed to initiate positive tendencies in Ukrainian economy. Recall that the Golden Horde tradition is interested in personal faithfulness not in professional qualities of government officials. The chief Ukrainian politicians have demonstrated incompetence in managing either the industry or the country and have to apply for Western loans. Therefore, the EU has real financial levers for influencing the Ukrainian establishment. It was shown by Hanna Severinsen and Renate Volvend, the speakers on the Ukrainian issue on the latest Parliamentary Assembly of the Council of Europe.

We should note however, that European integration is attractive to the majority of Ukrainian citizens mostly due to the high living standards in modern Europe, i.e. this attitude is clearly mercenary. ***The majority of our citizens, unfortunately, do not understand that these high living standards are consequence of durable democratic development of European countries and are ensured by adequate democratic institutions.***

The ruling circles of Ukraine, on one hand, see integration to NATO and the EU as guarantee of preservation of their status and their property having expropriated, on the other hand, they are interested in preservation of an authoritative oligarchic political regime. Such stance is essentially contradictory: to integrate into democratic Europe while remaining a totalitarian state. The experience of such ideological deception has been acquired in the decades of Soviet propaganda. However, it seems that European politicians begin to understand the essence of the problem. Renate Volvend said that it is important not just to adopt new legislation, new Criminal and Civil codes but to learn to implement these new laws, and Ukraine still have a long way to pass in this sphere. Therefore, the position of Official Delegation of the EU at Yalta summit (September 2001) insisting on acceptance of European values by Ukraine is quite justified.

Nevertheless, Ukraine has already demonstrated certain progress towards Western Europe: joining the WTO, increase in trade turnover, certain legislation reforms and establishment of separate department for Euro-integration issues in the Ministry of Economics. At the summit president Leonid Kuchma put it quite clearly: "Ukraine will not turn from the way of Euro-integration", and Foreign Minister of Ukraine A. Zlenko explained this phrase in more detail: "Ukraine agrees with the concept of new Europe, the basis of which are the European Union, the Council of Europe and the North Atlantic Treaty Organization. These institutes are the reference-

points of the European orientation of Ukraine". These statements of the country authorities are supported with positive changes in military contacts within the framework *Partnership for Peace* program and close cooperation in peacekeeping operations in Kosovo and Macedonia. Generally, it seems that foreign policy of Ukraine better corresponds to the Euro-integration course than its home policy. In connection with this, NATO Secretary General Lord George Robertson said that the cooperation between Ukraine and NATO is aimed at supporting the general process of reforms in Ukraine and this cooperation shows that the Alliance is determined not to leave Ukraine alone on its way to the future. At the same time, in spite of the fact that Ukraine-NATO cooperation develops quite fruitfully, the Cold War stereotypes are still alive in the consciousness and sub-consciousness of significant part of Ukrainian population.

In Ukraine, as well as in the majority of the former Soviet republics, the social transformation of last decade were so great, that the process of public consciousness adaptation to the changes and elimination of ideological burden of the previous epoch has not finished yet. As sociological researches claim, "approximately half of Ukrainians consider NATO as an aggressive block and are critical towards its expansion to the East" (the data of the Ukrainian Centre for Economic and Political researches, September 2001).

***This project aimed to provide a broad analysis of this contradiction between the evident social and political benefits of collaboration with NATO and negative attitude to the Alliance prevailing among the population of Ukraine and to find optimal ways of eliminating the contradiction with the assistance information technologies.***

## 1. THE MODEL AND THE METHOD OF RESEARCH

The modern conception of life allows to regard it as a way of existence of information structures by means of their replication in time at various levels of structural organization: biological, mental (ideas and images - so-called "memes"), and virtual (self-reproducing computer programs: viruses and genetic algorithms)<sup>1,2</sup>. In other words, a genetic biological program reproduces a social individual mainly physically while cultural program reproduces him mentally; an individual exists simultaneously in two worlds (material and mental) significantly influencing each other.

*Let's remind, that informational identity is a pre-condition for formation of either biological or social organism, in the first case it is observed at the level of biological cells (genes) and in the second case - at the level of cultural and political tradition elements (memes).* Social heterogeneity of society causes dispersion of mentality of its social strata. For successful development of a democratic state, it is necessary that the majority of its politically active citizens support important political or social decisions being taken by the authorities. *Mass media* play a significant role in formation of mental attitudes of social strata, as they *not simply present news but "produce" them*<sup>3</sup>. It turns out that the integrated subjective estimation of an event by an audience can be influenced even with selection of event aspects covered in the news, saying nothing about the methods for latent manipulation on mentality<sup>4,5</sup>. *Nevertheless, informational and educational functions of mass media satisfy certain public needs and constitute an integral part of stability and positive dynamics of a society.* Thus, the methods for objective estimation of multi-component basis of information domain are necessary. So are the methods for forecasting the consequences of certain events. *We can expect that intellectual modelling of direct and remote consequences of political actions can help politicians to avoid taking unreasoned decisions.* All of this justifies artificial intellectual systems development in the field of the social phenomena. This task can be successfully solved only in an interdisciplinary framework. *Since informational messages are in its essence a kind of life form, an acceptable model of informational influence should be developed in the form of*

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<sup>1</sup> Dawkins R (1993): "The Selfish Gene", Moscow: Mir.

<sup>2</sup> Yushchenko A., Zavolodko A (2001): "Intellectual Modeling of Information Domain Influence on Social Strata", Vestnik NTU "KhPI", no. 4, pp.281-284.

<sup>3</sup> Zimbardo P., Leippe M. (2000): "Psychology of Attitude Change and Social Influence", S.P.B.

<sup>4</sup> Myers D. (2000): "Social Psychology", SPB.

<sup>5</sup> Yushchenko A., Sergienko I. (2000): "Information Monitoring and Information Correction of Some Sources of Regional Instability", Proc. Of Int. Conf. of BESEC & ICBSS, Kharkov, Ukraine.

*neural networks and genetic algorithms, which is still a rather complex task for modern science*<sup>1</sup>.

The information domain influences mentality of an individual through TV, radio, press, Internet etc. producing certain types of reaction in various social strata to certain issues. Extracting a stratum basing on common mental attitudes of their members, we may introduce a concept of ***statistical model of stratum intelligence***. Such model should be based on common social behaviour style and common style of thinking usually referred as ***mentality***. While general models - even an approximate ones - cannot be implemented now, modelling of specific social or political aspect (e.g. the dynamics of Ukrainian public opinion about NATO - in our case) is quite possible.

Note that the cultural environment influencing the individuals of the stratum during their lifetime forms a stratum mentality. *Changes in informational environment cause transformation of mentality in certain direction*. Detecting the relationships between information environment and a stratum mentality allows determining what practical informational actions are necessary to maintain social stability. It is clear that informational influence is not direct and simple and individuals always interpret it through the prism of their creativity. Therefore, intelligence model improvement should take into account creativity of individuals, which, by its nature, follows the evolutionary laws of Nature<sup>2</sup>. It can be called *"grey box" modelling of social and biological systems*<sup>3</sup>. The obvious method of model improvement is the subsequent comparison of a model with data obtained in sociological researches.

For development of simpler expert systems in information domain it is quite possible to use a *"black box"* kind of models with some elements of *"grey box"* ones. The models of this kind are based on statistically established correlation between states of informational domain and mental states. Consequently, when we know an informational domain dynamics concerning certain issue and the dynamics of a stratum's attitude to this issue it is possible to calculate compensating information influence to minimize the danger of social instability. It is possible to describe a society through the sum of statistical characteristics of its strata. For the purpose of our research, the average size of the strata distinguished should be small enough to get uniform values of the observed parameters in each stratum. Distinguishing large number of strata, we have to use rather simple models describing each of them; otherwise, the model would grow so immense that it would make its implementation impossible. As a basis of

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<sup>1</sup> Foger D. (2000): "What Is the Evolutionary Computation?" IEEE Spectrum, February.

<sup>2</sup> Yushchenko A. (2000): " Megasynthesis Evolutional Logic and Causal Sources of a Global Catastrophe", Proc. Intern. Conference of BSEC: Disasters. Kharkov, Ukraine, 23-25 May, p.270-276.

<sup>3</sup> Marmelis P., Marmelis V. (1981): "Analysis of Physiological Systems", M: Mir.

simple statistical model of stratum reaction (further *group reaction*) on information influence, the method of multiple regression analysis was used.

The advantage of this method is that it allows building models of interaction of a set of independent variables with dependent ones. The parameters of attitude to NATO dynamics for various groups of the population of Ukraine act as dependent variables in our model (see below). Thus, we took the informational space parameters obtained with the content-analysis method as independent (influencing) variables. Multiple regression procedures describes processes in the form of the linear equation:

$$Y = a + b_1 * X_1 + b_2 * X_2 + \dots + b_p * X_p,$$

where:

Y is a dependent variable;

X<sub>p</sub> is an independent (influencing) variables;

b<sub>p</sub> is non-standardized regression coefficients (or β-coefficients) representing the independent contributions of each independent variable to the dependent variable prediction,

a is a constant (intercept).

We selected twenty-four factors describing mass media influence on public opinion. Sociological interrogation database contains data for six time intervals within the periods of 1996-2000. Regression analysis is possible when there are N periods and N-1 independent (influencing) variables in one equation.

Therefore, we formed multiple regression equations with independent variables organized in categories as it is described in the Chapter 4.

The method used is illustrated in Fig. 1.1. The graph represents the dependence of positive attitude to NATO in one of the strata (Ukrainian, living in pro-Ukrainian regions, in towns, 30-49 years old) and the number of positive messages about NATO in "Fakty I Kommentarii" newspaper – one of the most popular in Ukraine.

The regression analysis results are given in the following table\*.

**Table1.1. Regression summary for dependent variable: Y(AABC)**

R= 0.98601235, RI= 0.97222035, adjusted RI= 0.95833052						
F (1,2)=69.995, p<0.01399, std. estimation error is 0.01826.						
	B (standardized regression coefficient)	Std. error of B (standard error)	β (non- standardized regression coefficient)	Std. error of β (standard error)	t(2). The t-value and resulting p-value is used to test the hypothesis that the intercept is equal to 0	p-level (statistical regression)
Intercept			1.847455	0.011074	167	3.59E-05
POS	0.9860123	0.117855106	0.320966	0.0383641	8	0.013988

\* The STATISTICA for Windows, Release 5.0 package was used

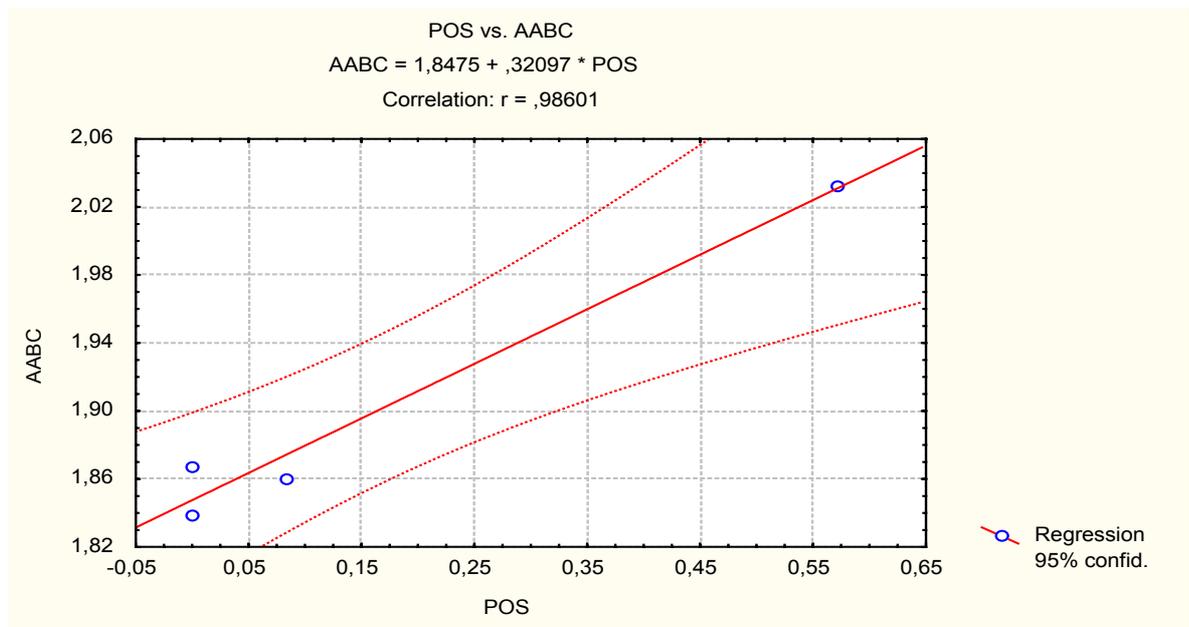


Fig. 1.1. An example of regression graph

The signs used in the table:

R is the coefficient of multiple correlations; it is the positive square root of R-square (the coefficient of multiple determination, see residual variance and R-square below). The statistic is used in multivariate regression (i.e., with multiple independent variables) to describe the relationship between the variables.

R-square (RI): this coefficient of multiple determination measures the reduction in the total variation of the dependent variable due to the (multiple) independent variables.

$$R\text{-square} = 1 - [Residual\ SS/Total\ SS]$$

Adjusted R-square (adjusted RI): the R-square is adjusted by dividing the error sum of squares (SS) and total sums of square by their respective degrees of freedom (df).

$$R\text{-square (adjusted)} = 1 - [(residual\ SS/df)/(total\ SS/df)]$$

Std. error of estimate: this statistic measures the dispersion of the observed values about the regression line.

F, df, and p-value: the F-value and resulting p-value is used as an overall F-test of the relationship between the dependent variable and the set in independent variables. Here:

$$F = regression\ mean\ square/residual\ mean\ square.$$

While three independent variables primarily were included in the model, there is only one independent variable in the equation given below (POS). The reason for not including all other variables in the final equation was that their influence on dependent variable was found insignificant ( $p > 0,05$ ). Only the POS variable contribution to the dependent variable appeared significant – 95% ( $p = 0.014$ ).

Positive value of  $\beta$ -coefficient means that there is a direct relation between the number of positive messages in this newspaper and the number of positively oriented towards NATO members of the group. For this group regression equation, looks like:

$$Y (\text{AABC}) = 1.847 + 0.321 * \text{POS},$$

where:

Y (AABC) is attitude to NATO dynamics for group 1123;

POS is the number of positive messages in the newspaper;

0.321 is a regression coefficient (or  $\beta$ -coefficient) denoting the independent variable contribution to the information domain component influence on this group opinion;

1.847 is a constant (intercept).

The analysis process used in our research can be described as a four-step procedure.

**Step one.** Content-analysis data allowed calculating the measure of certain information domain component influence (as independent variables) on the dynamics of opinion in certain group.

The table below shows the interrelation between the data of content-analysis of “Argumenty i Fakty” (as independent variables) and the positive dynamics in group Y (AAAA).

**Table 1.2. The analysis of the interrelation between dependent and independent variables**

Factor	Variables	Resulting p-value	Significant independent variables (p)
Quantity	TIR, PPN, V, VIS	0.04471	TIR (0.056309)
			PPN (0.078639)
Message orientation	INF, ANAL, OPIN, CAL	0.087122	CAL - have no variance
General attitude towards NATO	POS, NEU, NEG, ATTIT	0.185239	
Anchor-constructs	RICH, PUR, DEF, AGR, DEP, AUT	No variables in the regression equation	RICH, PUR, DEF, AUT – remain constant
Groups of reference	PRES, PARL, ISP, NGO, PART	0.214797	PRES, ISP, NGO – remain constant
Russia factor		No variables in the regression equation	

It can be seen in the table that some variables remain constant in all six samples (as a rule it means that they have zero values, for example CAL variable was not found in “Argumenty i Fakty” publications during the period studied).

"No variables in the regression equation" means that no independent variable appeared to have a significant influence on the dependent variables.

In this table, resulting p-value is used as an overall F test of the relationship between the dependent variable and the set of independent variables, i.e. as a measure of significance in regression model. Thus, we could proceed with the step two.

**Step two.** We arranged the six factors according to their p-values. The least p-value means that the set of variables constituting this factor gives the best description for the dependent variable dynamics. In our example (see the table below) it is **Quantity factor** having the least resulting p-value – 0.04471. Thus we can say that it is this factor and TIR variable ( $p = 0.056309$ ) that give the best description of the positive dynamics in Y (AAAA) group. PPN variable has  $p = 0.078639$  that is not statistically significant.

**Step three.** We repeated the same procedure for the dynamics of negative and undetermined attitudes to NATO in-group Y (AAAA). As a result, in each case we obtained factors and variables, which give the best description for the correspondent dynamics.

The results for each group looks like the following:

**Table 1.3**

<b>Attitude</b>	<b>Significant independent variables</b>	<b>Factor<sup>1</sup></b>
POSITIVE	TIR	Quantity
NEGATIVE	NEG	Message orientation
UNDETERMINED	RICH	Anchor-constructs

Sometimes there was no significant factor at all. In such cases our three-component equation transformed into two-component or single-component one.

**Step four.** We repeated steps one and two for all information domain components and get corresponding results for each of them in all groups. The variables and  $\beta$ -coefficients obtained for each variable were used in the expert system.

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<sup>1</sup> The factors having the least p-values among the six factors studied in each case are given in this table.

In general, the research detected eleven relations between certain anchor-constructs and eight population groups; six relations were found in pro-government press and five – in radical media.

The table below describes the distribution of the anchor-constructs in the media.

**Table 1.4**

	<b>Dependence</b>	<b>Aggression</b>	<b>(Physical) defence</b>	<b>Financial well-being</b>
Pro-government press	-	3	2	1
Left radical press	4	1	-	-

It is evident in the table that *dependence* and *aggression* are the most frequent constructs influencing the group opinions. The former is more influencing in left radical press, the latter – in pro-government press.

Special attention should be paid to groups that according to our data are prone to the influence of anchor-constructs given in the media. We detected that *defence* construct appearing in pro-government press favourably influences NATO image among aged Ukrainians (older than 50) living in pro-Russian regions. Using this construct increases the number of NATO supporters in group 42 and decreases the number of NATO opponents in group 45. Similar effect for the younger groups (43, 44) can be obtained from using *dependence* construct in left radical press. *Aggression* construct in pro-government press negatively influences NATO image among Russians 30-49 years old living in pro-Russian regions.

Thus, having  $\beta$ -coefficient, we can estimate the dynamics of a group's attitude to NATO basing the number of messages of different types appearing in press and, vice versa, we can calculate the number and character of messages necessary to gain the desirable attitude dynamics. The accuracy of calculations according the model depends on completeness of the databases containing the formalized data about type and amount of the information consumed by an individual and databases with the results of sociological interrogation describing the dynamics of public opinion about NATO.

Regressive analysis allows determining quantitative dependency between informational influence and the reaction on it in some stratum revealing itself in public opinion dynamics. The causes of the reaction can be explained with methods of sociology and cognitive psychology. Such interdisciplinary approach allows building an expert system for intellectual modelling of informational management of the dynamics of political mentality concerning NATO in the strata of Ukrainian society.

Table 1.5 Anchor-constructs influence on some groups

Group No.	Demographic characteristics				How anchor-constructs influence the group attitude to NATO	$\beta$ -coefficient
	Region	Nationality	Settlement type	Age		
42	pro-Russian	Ukrainian	small town	older than 50	<i>Defence</i> construct in pro-government media increase the number of NATO supporters	0.846
43			city	18-29	<i>Dependence</i> construct in left radical press decrease the number of NATO opponents	-0.877
44			city	30-49	<i>Dependence</i> construct in left radical press increase the number of NATO supporters and decrease the number of NATO opponents	0.955 and -0.939
45			city	older than 50	<i>Defence</i> construct in pro-government media decrease the number of NATO opponents	-0.939
53			Russian	city	30-49	<i>Aggression</i> construct in pro-government media decrease the number of NATO supporters.

## 2. RESEARCH LOGIC

Detailed data describing the dynamics of attitude to NATO in different strata of Ukrainian population was necessary for the project. We used the results of sociological interrogations for the period of 1996-2000. We also needed data on coverage of the Alliance image and politics by Ukrainian mass media. For this purpose, we performed content-analysis of printed mass media for the same period. Taking into account that in the printed media share in the informational domain had reduced and TV had become the main source of information, similar data on TV messages were very important. Since there were no corresponding retrospective data available about TV, we took the following decisions. First, since November 1999 constant monitoring of all dominating TV channels, radio channels and newspapers was provided. Second, the content-analysis for the full range of printed media was performed during the same period. It allowed us to prove our hypotheses that:

- dominating mass media are similar at least in their attitude to the Alliance;
- it is possible to choose some newspaper, which would reflect an average way of NATO presentation by main TV channels.

Due to the incompleteness of initial databases, the basic emphasis in research was made on the logic expert analysis of strata dynamic using the methods of sociology and cognitive psychology. The detailed analysis performed allows us to formulate recommendations as to effective informational policy aiming on developing positive image of NATO. Moreover, a knowledge-based expert system with elements of cognitive and regression analysis was developed. The system can be useful as an instrument for optimising the Ukrainian mass media information policy concerning NATO. The expert system has the following features:

- It is possible to add new databases and new logic rules to the system.
- It is possible to perform direct conclusion (i.e. to estimate change in public opinion by results of monitoring of informational domain).
- It is possible to perform reverse conclusion (i.e. to determine necessary informational influence to obtain desired attitude dynamics in certain group).
- It is possible to add new blocks to the system for regression and correlation analyses of data.
- The system has a user-friendly interface and a context help system.

Regression coefficients calculated for the printed mass media should be considered approximate because it is very difficult to eliminate the influence others information domain components. The coefficients obtained for "Fakty i Kommentarii" newspaper are the most reliable.

The input to the model consists of the formalized data received from content-analysis of information about the Alliance in mass media. It allowed us to avoid subjectivity, to generalize significant amount of information and to convert data into digital form for further processing on computer. We used *Visual-Prolog* for logical programming our social model. This programming language implements predicate calculus to perform inferences from a large set of facts contained in a database using a knowledge base comprising inference rules.

Currently only a prototype version of the expert system is available, ***but it is already able to make intellectual modelling of informational management of the dynamics of political mentality concerning NATO in the strata of Ukrainian society.***

### 3. SOCIOLOGICAL STATISTIC VALUE AND GROUP DIFFERENTIATION

#### 3.1 The description of the statistical data used in the research

The statistical data used in this project was obtained from the wide interrogation of representative sample of Ukrainian citizens (see table 3.1 for sample sizes) carried out annually in 1996-1999, and in July and November 2000 by the Institute for Social and Political Psychology of Academy of Psychological Sciences of Ukraine (Kyiv).

**Table 3.1. Interrogation sample sizes**

<b>Interrogation date</b>	<b>Sample size</b>
1996	2027
1997	2021
1998	2001
1999	1999
July 2000	2008
November 2000	2005

Initial processing of a data was carried out with the purpose of distinguishing the groups in the Ukrainian population, which significantly differs in their attitudes towards NATO. Two blocks of variables were used in data processing:

Block 1 – a respondent’s reaction to two key statements determined his/her position of in the two-pole space: “rejection of NATO” — “acceptance of NATO”. The statements used were borrowed from mass media and had strong emotional character that facilitates their perception by the respondents. Below are the two key statements.

1. ***Our rescue from the Russian imperial threat is in joining NATO.***

Close-ended question. Three possible answers were proposed: disagree, it is hard to say, agree.

2. ***The Western-oriented policy aiming to joining NATO is an anti-national policy having no future.***

Close-ended question. Three possible answers were proposed: disagree, it is hard to say, agree.

Block 2 – demographic variables. During the previous analysis, they were grouped as follows.

**1. Age:**

- 1 – 18 – 29\*
- 2 – 30 – 49
- 3 – 50 and older

**2. Sex:**

- 1 – male
- 2 – female

**3. Nationality:**

- 1 – Ukrainian
- 2 – Russian
- 3 – other (because the amount of representatives constituting given category was insignificant in the researched samples, it was not considered in the subsequent analysis)

**4. Settlement type**

- 1 – village
- 2 – town (less than 50000 inhabitants)
- 3 – city

**5. Region**

- |                       |                         |
|-----------------------|-------------------------|
| • 1 – Crimea          | • 14 – Kyivsky          |
| • 2 – Odesky          | • 15 – Cherkasky        |
| • 3 – Nikolaivsky     | • 16 – Kyrovogradsky    |
| • 4 – Khersonsky      | • 17 – Vinnytsky        |
| • 5 – Donetsk         | • 18 – Khmelnytsky      |
| • 6 – Lugansky        | • 19 – Zhitomyrsky      |
| • 7 – Zaporizky       | • 20 – Rivnensky        |
| • 8 – Dnipropetrovsky | • 21 – Volynsky         |
| • 9 – Kharkivsky      | • 22 – Chernivetsky     |
| • 10 – Sumsky         | • 23 – Zakarpatsky      |
| • 11 – Poltavsky      | • 24 – Ternopilsky      |
| • 12 – Chernigivsky   | • 25 – Ivano-Frankivsky |
| • 13 – City of Kyiv   | • 26 – Lvivsky          |

It is necessary to note, that administrative division of Ukraine reflected in **Region** variable, was not convenient for the purposes of our project, therefore we accepted less fractional but more functional division, reflecting specificity of the attitude of the population of regions to the foreign policy of Ukraine. This division was proposed by the Institute for Social and Political Psychology of Academy of Psychological Sciences of Ukraine.

First group. The so-called “**pro-Ukrainian**” (patriotic) regions (including Kyiv, Vinnytsky, Zhitomyrsky, Kyivsky, Kyrovogradsky, Khmelnytsky, Cherkasky, Ivano-Frankivsky, Lvivsky,

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\* 18 years is the age when a person gets the right to vote according to the legislation of Ukraine.

Ternopilsky, Volynsky, Zakarpatsky, Rivnensky and Chernivetsky regions). We expected this group being mostly “NATO-oriented”.

Second group. The regions, where *centrist* attitudes dominate: Nikolaivsky, Odesky, Khersonsky, Dnipropetrovsky, Zaporizsky, Kharkivsky, Poltavsky, Sumsky and Chernigivsky. They form so-called “centrist” group.

Third group. The so-called “*pro-Russian*” regions: Crimea and Sevastopol, Donetsk and Lugansky.

The data file consists of six data matrices (one matrix per year). To split the sample onto groups by their attitudes towards NATO, we did initial statistical file processing.

### 3.2. Justification of group differentiation

1. Regression approach (stepwise multiple regression method\* was used; see Table 3.2 for the results).

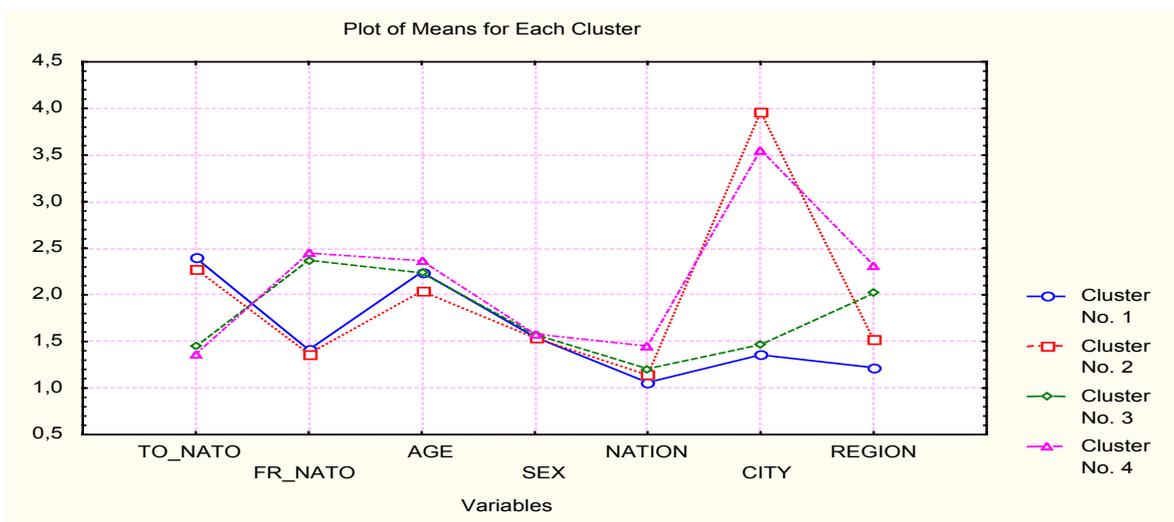
**Table 3.2. The results of the stepwise multiple regression analysis**

Variable	Positive attitude towards NATO	Negative attitude towards NATO	General amount of links
Age	1	5	6
Sex	3	1	4
Nationality	6	4	10
Region group	5	6	11
Settlement type	4	0	4

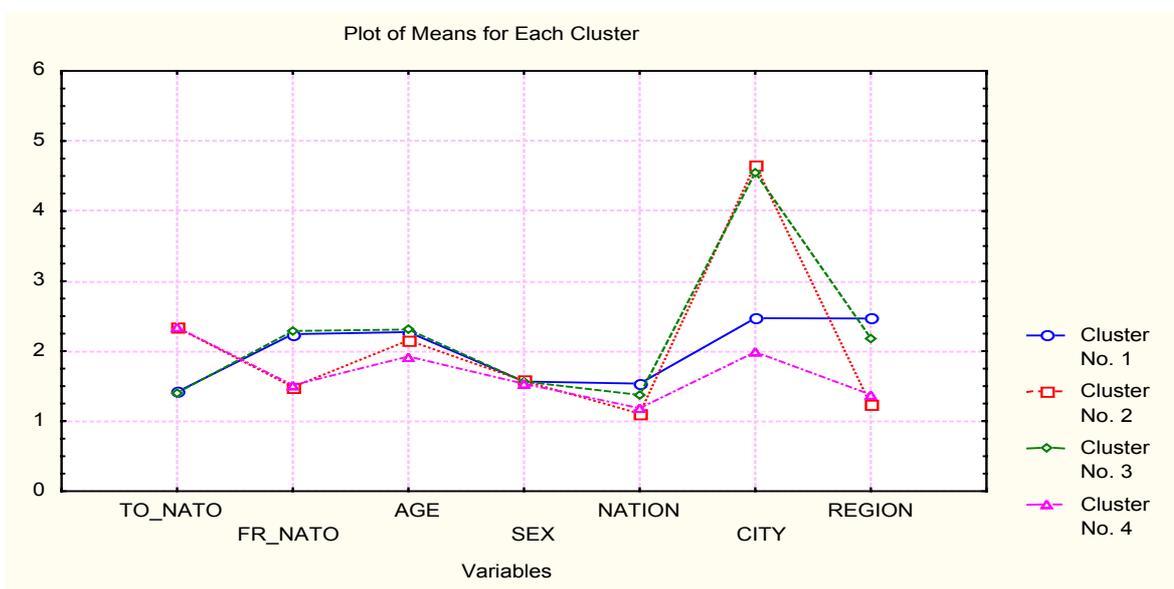
The table cells contain the number of significant correlation links ( $p > 0.05$ ) between demographic variables and key variables in the six matrices. For example, number three on crossing of “sex” row and “positive attitude towards NATO” column means, that in three matrices out of six the first variable significantly determined the second one. It reflects the contribution of a demographic variable to the dynamics of key variables, hence, the variables with the maximum amount of such significant correlation links can be considered as polarizing the sample as to the attitude to NATO. In can be seen in the table that the variables “nationality” and “region group” unequivocally can be considered as polarizing factors, whereas other variables give less certain picture. For example, variables “age” and “settlement type” are significant only in relation to one of the poles of the key variables (the former one – to the positive pole, the later one – to the negative pole). Cluster analysis of data file was conducted to calculate the each variable’s influence on public opinion. Cluster analysis of data file (k-means clustering method used, graphs 3.1 - 3.6 for the results).

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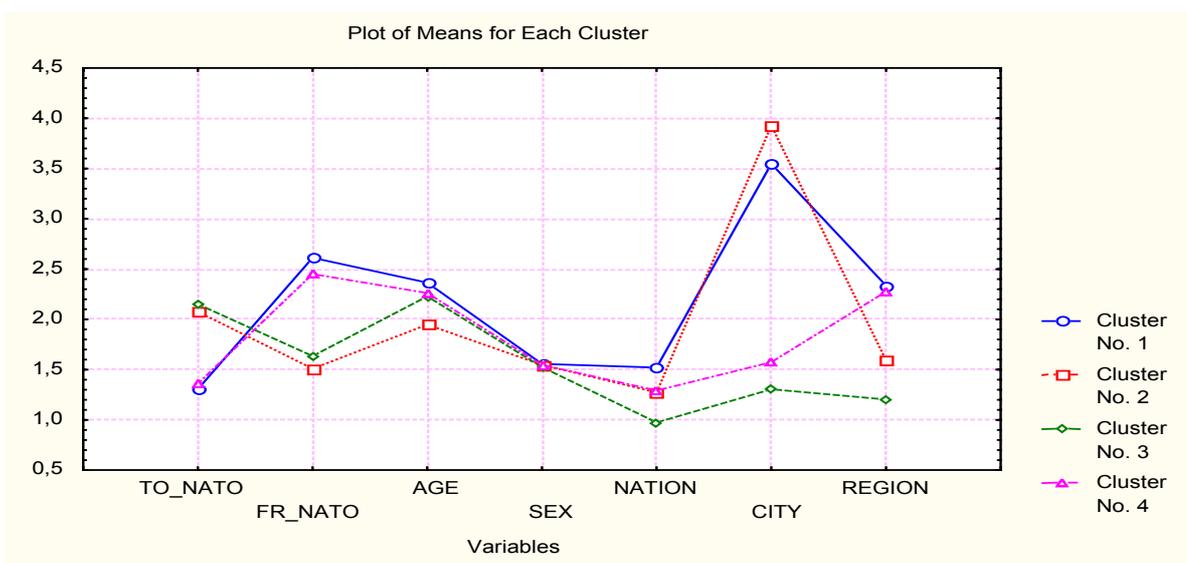
\* The STATISTICA for Windows, Release 5.0 package was used.



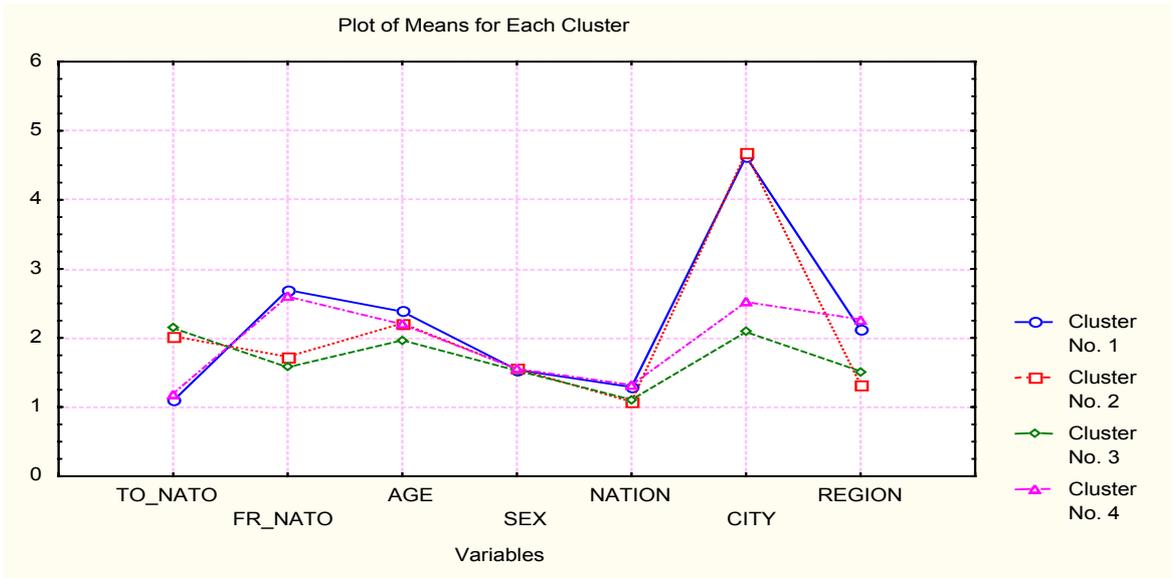
Graph 3.1. The meaning of each cluster (for 4 clusters) (1996)



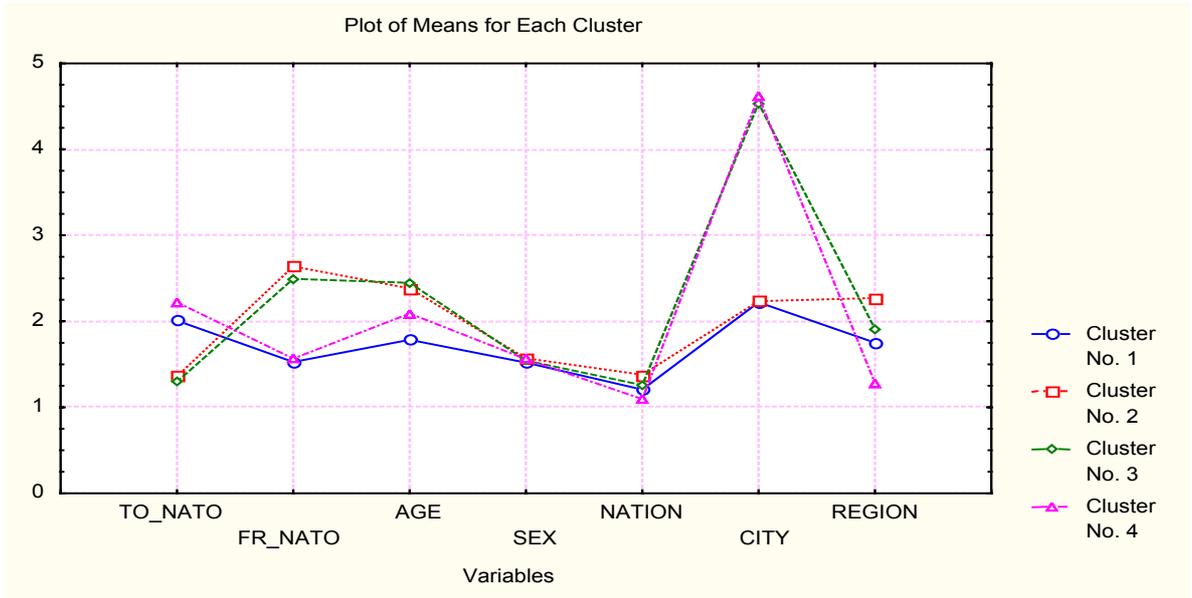
Graph 3.2. The meaning for each cluster (for 4 clusters) (1997)



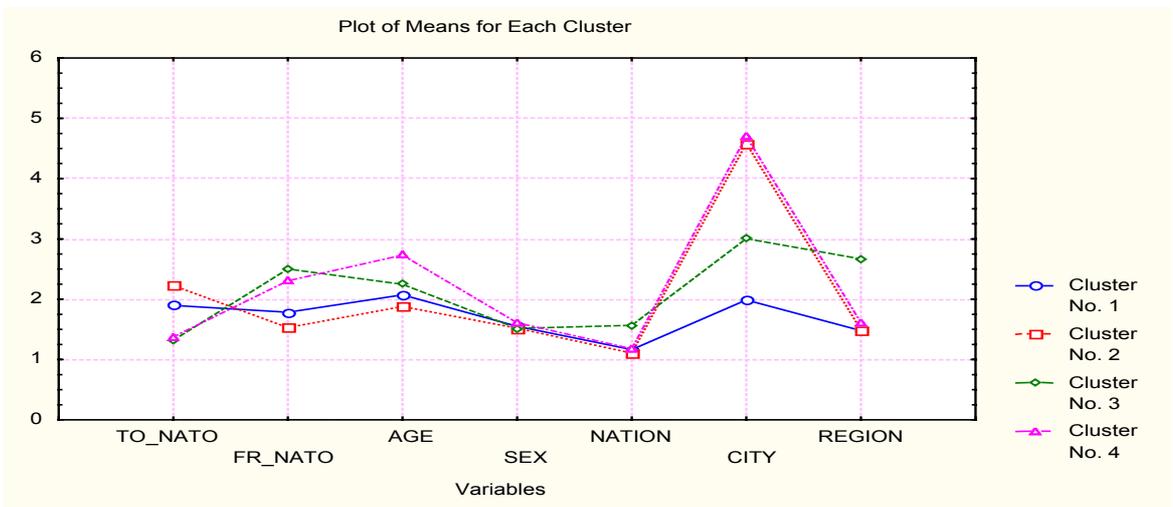
Graph 3.3. The meaning for each cluster (for 4 clusters) (year 1998)



Graph 3.4. The meaning for each cluster (for 4 clusters) (1999)



Graph 3.5. The meaning for each cluster (for 4 clusters) (2000, the 1<sup>st</sup> interrogation)



Graph 3.6. The meaning for each cluster (for 4 clusters) (2000, the 2<sup>nd</sup> interrogation)

The graphs clearly displays what factors contribute most of all to splitting the sample (they produce the most significant divergences between means). In particular, the role of the variables “age” and “settlement type” becomes more evident. At the same time, it is clear that “sex” variable does not contribute to splitting the sample.

Chapter conclusions: the analysis provided suggests that the following demographic variables may be recognized as significant in determining a group’s attitude to NATO:

1. Nationality.
2. Region of residence.
3. Settlement type.
4. Age.

Considering this, we distinguished fifty-four groups in Ukrainian population, differing in their attitude towards NATO. The codes assigned to them are presented in Table.3 3.

**Table 3.3. The coding of groups**

<b>Code</b>	<b>Region</b>	<b>Nationality</b>	<b>Settlement type</b>	<b>Age group</b>
1	Pro-Ukrainian (patriotic)	Ukraine	Village	18 – 29
2	Centrist	Russia	Town	30 - 49
3	Pro-Russian		City (more then 50000 inh)	Older than 50

The percentage and quantitative structure of the groups is given in Appendix 1

## 4. THE METHODS OF CONTENT-ANALYSIS OF MASS MEDIA

### 4.1. The research technique

To study information domain the method of the quantitative analysis of documents (content-analysis) was chosen for the following reasons:

- this method allows comparing similar variables describing various information sources;
- the significant amount of available textual material makes it hard to evaluate informational domain without using generalized estimations;
- quantificated texts can be easily compared with the variables describing the behaviour patterns of various groups of individuals in relation to NATO (e. g., whether there is a correlation between the increase in amount of positive publications about NATO and the changes in the attitude towards the Alliance in certain group of individuals).

The goal of the content-analysis was to study the trends in the coverage of individual actions as well as the whole image of NATO by various subjects of information domain (newspapers).

### 4.2. Research tasks

1. To describe the dynamics of NATO-related event coverage by individual mass media and determine the differences among the subjects of information domain.
2. To calculate ratio of NATO-related messages in the total amount of information published in a newspaper<sup>1</sup>.
3. To study various factors strengthening or weakening text influence on individuals.

We used NATO theme as a unit for content-analysis. Articles, semantic paragraphs, parts of texts as well as structural elements of texts where the term “NATO” or its substitutes (such as Alliance, the North Atlantic Union etc.) was directly mentioned were subjected to detailed analysis.

The influence of the newspaper information on an individual depends on a set of categories that conditionally can be divided in two groups:

- Social and psychological characteristics of an individual (age, education, criticality of thinking, mental rigidity etc.);
- Textual information characteristics and the ways of its presentation.

Performing content analysis we tried to clarify the extend to which individual is influenced by the categories of the second group. We distinguished the following categories as the most significant.

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<sup>1</sup> Here we consider printed mass media only; we discuss other information domain components (TV and radio) later.

1. **Quantity category** reflects major quantitative parameters of NATO-related messages in mass media: size, frequency, etc. It consists of following variables:

- Frequency of publication (the more frequently an individual faces information of certain type, the more habitual and ordinary it becomes for him/her);
- Announcement on the first page (presence of an announcement increases the probability of drawing an individual's attention to the publication);
- Illustrations (photos, caricatures, collages etc.);
- Size (a tiny note has more chances to remain unnoticed by a reader);

These variables were coded as follows:

**Table 4.1.**

Symbol	Variable	Short description
TIR	Circulation	Circulation of the certain newspaper
PPN	Ratio of NATO-related messages	Number of pages with NATO-related articles per issue
V	Average size	Average size of NATO-related messages per issue (in cm <sup>2</sup> )
VIS	Illustrations	Presence of illustration(s) in NATO-related article

2. **Message orientation.** This category determines message goals, its emotionality and degree of direct (explicit) influence on an audience. It consists of types of message orientation forming continuum from *information* (the least emotional) to *call* (the most emotional).

See Fig.4.1 for the graphic representation of the category.

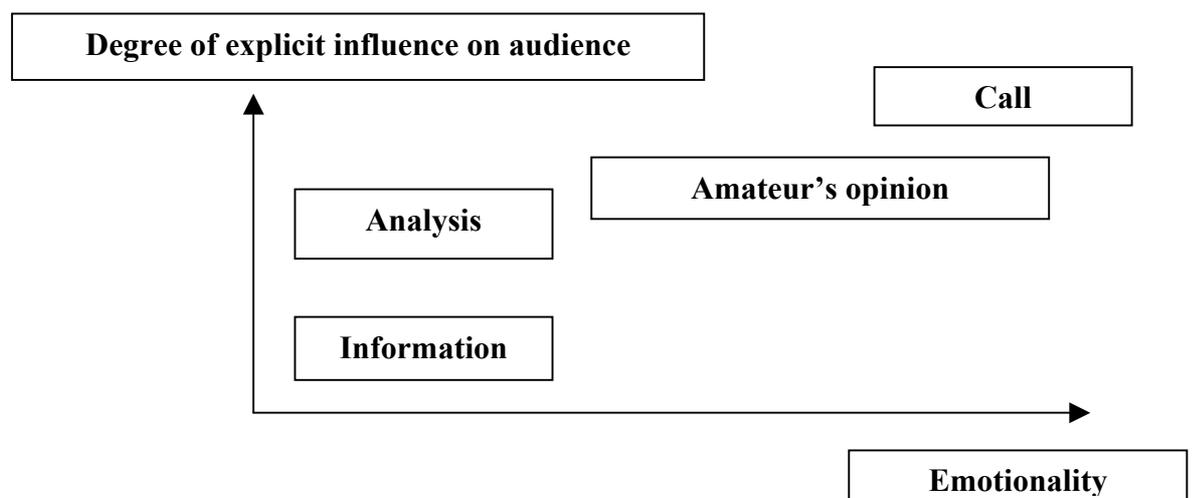


Fig.4.1 Message orientation

Message orientation variables were coded as follows:

**Table 4.2.**

<b>Symbol</b>	<b>Variable</b>	<b>Short description</b>
<b>INF</b>	<i>Information</i>	<p>Minimum emotionality, and the least degree of direct influence on an audience.</p> <p>The goal of this message type is to provide audience with facts upon which independent analysis of politics may be performed.</p>
<b>ANAL</b>	<i>Analysis</i>	<p>Minimum emotionality, and medium degree of direct influence on an audience.</p> <p>The goal of this message type is to provide an audience with qualified analysis of politics that may or may not be accepted by recipients. This type of message is addressed to conscious mechanisms of information processing and does not tend to be manipulative.</p>
<b>OPIN</b>	<i>Amateur's opinion</i>	<p>Here a professional politician can be an amateur as well if one writes an article as a private person and does not ground one's conclusions on statistically verified data. Being more subjective than analysis, this message type often brings significant manipulative potential (especially when taking the form of analysis). It is moderately emotional and is of medium degree of explicit influence on recipients.</p>
<b>CAL</b>	<i>Call</i>	<p>This type of message rarely can be seen in central Ukrainian press (usually moderately liberal). It is extremely emotional and is of maximum degree of direct influence on recipients.</p> <p>This message type goal is to persuade a recipient. It often employs manipulative techniques and addresses to subconscious levels of a recipient's psychology.</p>

3. **General attitude towards NATO.** This category reflects emotional attitude of an article towards NATO. It was obtained by cross-correlation of independent opinions of three experts.

These variables were coded as follows:

**Table 4.3.**

Symbol	Variable	Short description
<b>POS</b>	<i>Positive attitude</i>	Author of the article is positive in his estimation of NATO and its activities
<b>NEU</b>	<i>Neutral attitude</i>	Author of the article tries to avoid estimations of NATO and its activities
<b>NEG</b>	<i>Negative attitude</i>	Author of the article is negative in his estimation of NATO and its activities
<b>ATTIT</b>	<i>General attitude</i>	Message type (positive or negative) prevailing in articles during certain period.

4. **Anchor-constructs category.** This factor is based on the theory of human motivations developed by Abraham Maslow<sup>1</sup>.

According to A. Maslow human needs are satisfied in certain order expressed in “Maslow hierarchy” (Fig. 4.2). Satisfaction of higher needs is impossible without previous satisfaction of lower needs. A. Maslow considered physiological and safety needs as basic ones for human motivation.

These lower needs can be addressed in a message without referring to consciousness by means of “anchors”. “Anchors” are conditional stimuli that being paired frequently enough with certain unconditional stimuli elicit the same reactions in a recipient as unconditional stimuli themselves do. E. G., such pairing of the USA image with aggression in Soviet information domain led to the situation when the USA image is an anchor of negative emotions: fear, aggression etc. It should be emphasized here that anchors are located preliminary in human sub-consciousness thus they are extremely resistant to rational argumentation at the same time playing a significant role in determining the picture of social world.

We developed the fourth category for the model of modern Ukraine information domain to describe the frequency of pairing NATO image with images of basic need satisfaction.

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<sup>1</sup> Maslow A.H. (1954) Motivation and Personality, New York: Harper & Row.

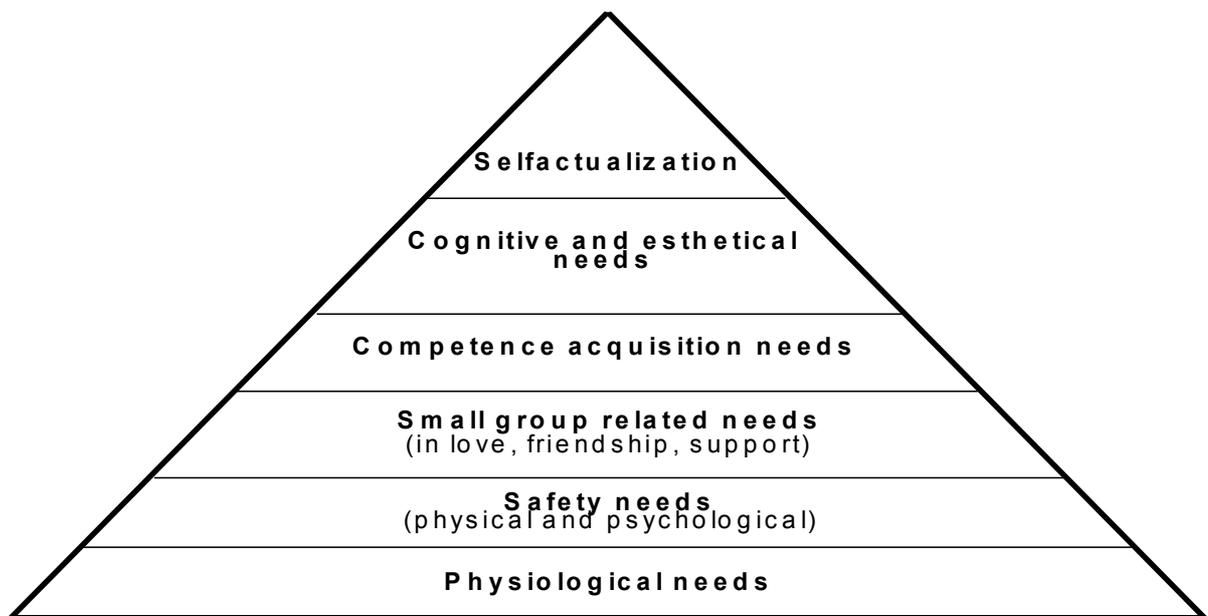


Fig. 4.2. Maslow's hierarchy of human needs

According to the Maslow's theory, we include the following constructs in the model.

**Table 4.4.**

<b>Groups of human needs (organized and prioritised according the Maslow's theory)</b>	<b>Symbol</b>	<b>Variable</b>	<b>Short description</b>
<i>Physiological needs</i>	<b>RICH</b>	<i>Prosperity</i>	A state of satisfaction of physiological needs
	<b>PUR</b>	<i>Poverty</i>	The opposite pole – a state of frustration of physiological needs
<i>Safety needs</i>	<b>DEF</b>	<i>Defence</i>	A state of satisfaction of physical safety needs associated with NATO
	<b>AGR</b>	<i>Aggression</i>	A state of frustration of physical safety needs associated with NATO
<i>Safety/self-actualisation needs</i>	<b>DEP</b>	<i>Dependency</i>	A state of satisfaction of psychological safety and self-actualisation needs associated with NATO
	<b>AUT</b>	<i>Autonomy</i>	A state of frustration of psychological safety and self-actualisation needs associated with NATO

We supposed that pairing NATO image with “satisfaction” pole of certain need would strengthen positive charge of this image and vice versa, it would be true for “frustration” pole. It was also supposed that different needs would play different roles and have different priority for different groups although Maslow’s hierarchy is true in general.

5. **Referent groups.** Dichotomous character of any message ( $S \rightarrow O$ ) determines that not only an object (target group) but also a subject of a message plays significant role. Referent group category describes “real” subject of a message as well as person (or organization) whose image is exploited in a message. Referent groups also serve as anchors, that for certain group are associated with certain emotional experience. E. G., in “pro-Russian” regions conservative right Ukrainian parties are mostly associated with negative emotions. Thus, message about NATO with a reference to a conservative right party can elicit extremely negative response in these regions.

We chose the following subjects of Ukrainian politics as basic referents.

**Table 4.5.**

Symbol	Variable	Short description
PRES	<i>President</i>	The President of Ukraine is mentioned in the message
PARL	<i>Parliament</i>	Ukrainian Parliament (Verkhovna Rada) is mentioned in the message
ISP	<i>Government and bureaucracy</i>	The article is written by a representative of bureaucracy or bureaucracy is mentioned in the message
NGO	<i>NGO</i>	The article is written by a representative of an NGO or an NGO is mentioned in the message
PART	<i>Political parties</i>	The article is written by some representative of political party or it is mentioned in the message

6. **Russia category.** Pairing NATO with Russia in one message was included as a separate category in the model. Traditionally Russia is viewed by significant part of Ukrainians as a real (and more “natural”) alternative to Western orientation. Partly this results from Russian-Ukrainian relationships in the Russian Empire and the USSR. Even those who prefer Western orientation (European or Atlantic), thinking of politics, treat (often subconsciously) Russian – the West pair as a dichotomy. Thus mentioning Russia in a message may have powerful potential influence on mass consciousness of Ukrainians.

Presence or absence of each of the listed above factors in a text analysed was marked as one or zero correspondingly.

Finally, we developed content-analysis matrix, which is included in the Appendix 2.

### 4.3. The choice of information sources for the research

An attitude towards NATO expressed in messages published in certain newspaper usually correlates with the newspaper general political orientation. The leftist media mostly adhere to integration with Russia and tend to present the Alliance negatively. On the contrary, the rightist media consider joining NATO the only chance for Ukraine. Therefore, in our choice of periodicals we tried to present all spectrums of political forces. Besides, we believe that it was necessary to analyse the mass media that reflect the positions of the basic authorities of Ukraine: the President and Parliament.

- We chose "**Kommunist**" as a typical leftist periodical. It is the organ of Communist Party of Ukraine (issued since February, 1994). With its limited significance, it nevertheless has an essential impact on certain part of Ukrainian readers.
- "**Fakty i Kommentarii**" – the central government (and President-oriented) newspaper.
- "**Golos Ukrainy**" - the newspaper of Verkhovna Rada (Parliament) of Ukraine (issued since 1990).
- "**Nezavisimost**" - a newspaper oriented towards rightist audience.
- "**Selskie vesti**" - a newspaper expressing interests of rural population.
- "**Argumenty i Fakty. Ukraina**" and "**Segodnia**" (issued since December, 1997) – the papers having big circulation in Ukraine.

We think that regional press influences an individual more than central one. Due to lack of money, individuals often buy regional newspapers that are cheaper and cover international and home politics as well as local events.

We chose Kharkiv newspapers "**Vremya**" and "**Vecherniy Kharkov**" to represent regional media.

We also chose the most proper TV channels: **UT-1**, **UT-2**, **Inter** and the **central radio channel**.

#### ***The specifics of content-analysis of TV messages***

In the analysis of TV messages, we mostly used the same technique as for the analysis of printed mass media. Nevertheless, certain corrections were necessary to take into account the specifics of video messages. The size of messages was measured in minutes. "Call" category was excluded from the list of message types because it practically never occurs in TV programs. We also did not consider "announcement" variable because, in our opinion, it plays slightly different role on TV. The variable illustration acquired some other sense: as illustration, we considered reportage directly from a place of events.

***The specifics of content-analysis of radio messages***

The technique of the content-analysis of radio messages was practically identical to that of television. The only difference was the absence of illustration variable.

Tables with the results of the mass media content-analysis are given in Appendices 3-5, correspondingly.

**Justification of information domain approximations based on content-analysis data for certain printed mass media sources**

An individual is certainly influenced not by a single information source but by the whole information domain, he/she lives in. At the same time, the influence of mass media changes from epochs to epoch. For example, radio was the most influential source of information in the middle of the 20<sup>th</sup> century, while the role of TV increased in 70-80<sup>th</sup>. By means of visual effects, TV gives an audience the feeling of participation in events. Now it is the most accessible and widespread way of spending leisure time. According to the results of sociological researches about 20% of Ukrainian citizens read newspapers, at the same time all of them watch TV more or less regularly. TV also enjoys the highest trust ratings among the media. The results of sociological interrogation conducted by "Inter" broadcasting company showed that 59.4% of people interrogated trust mostly TV, 16.3% - newspapers, 15.2% - radio and 8.9% - Internet news.

Thus, the TV influence on mass audience is essential and it certainly should be taken into account while analysing the information domain. However, we considered it sufficient for the expert system to be based on printed media due to following reasons:

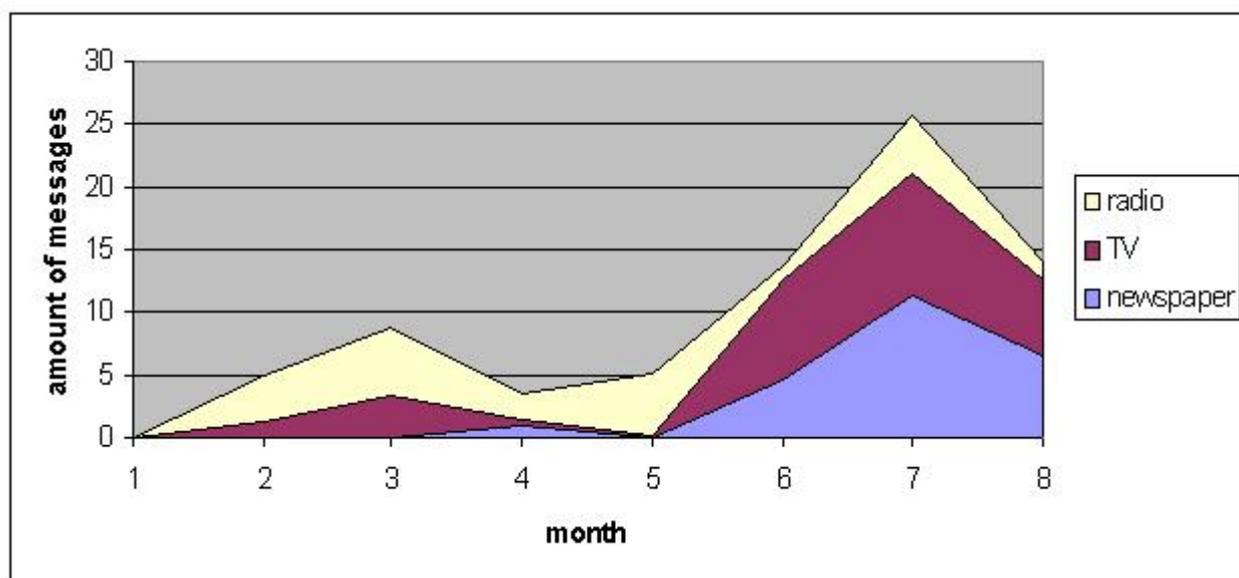
1. Often TV channel owners control one or more newspapers as well. Therefore, the attitude towards NATO in such newspapers and TV channels coincides. Thus to understand what the image of NATO was on TV during certain period, it is enough to analyse an attitude expressed in newspaper messages belonging to the owners of this TV channel.
2. Material for retrospective content-analysis of printed mass media (in fact we needed 6 points for analysis from the period of 1996-2000) was more accessible then that of TV and radio.
3. Starting a TV channel is an extremely expensive procedure as well as buying expensive TV time. It is beyond the abilities of most political forces in Ukraine. Thus in printed mass media a wider spectrum of attitudes towards NATO is presented while TV is mostly centrist.

4. We have assumed that general orientation of “Fakty i Kommentarii” newspaper reflects an orientation of TV information informational domain. To support the hypothesis we conducted the content-analysis of “Fakty i Kommentarii” newspaper, the central radio channel and the central TV channels during January-August 2001. (See table 4.6 for the detailed results).

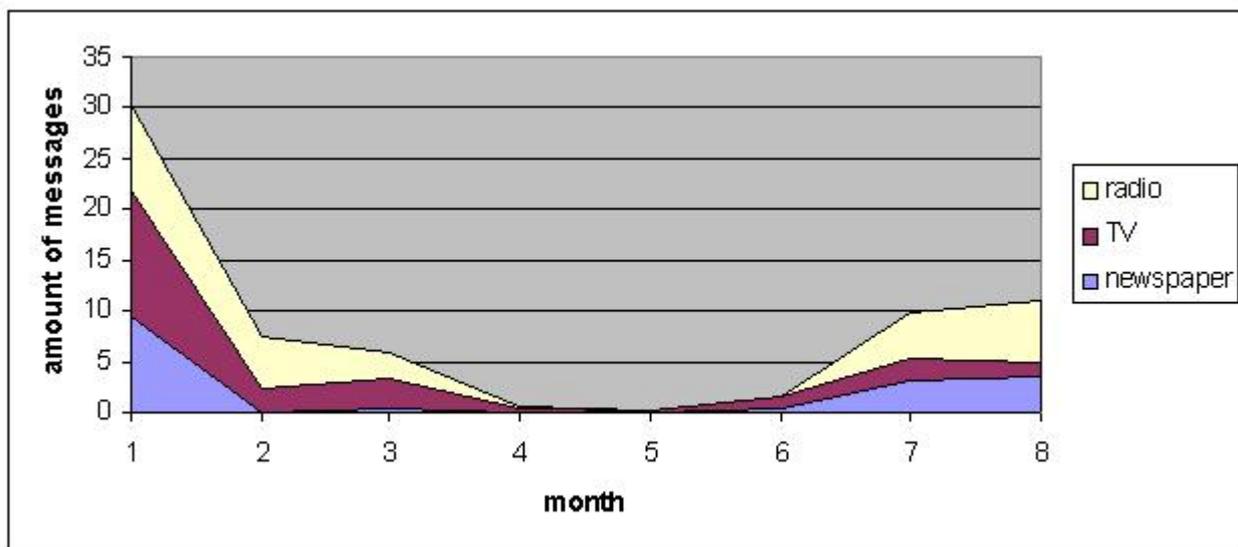
**Table 4.6. The results of the comparative analysis of printed, TV and radio information sources**

№	Month	Newspaper			TV			Radio		
		Pos	Neg	Neutr	Pos	Neg	Neutr	Pos	Neg	Neutr
1	Jan.01	0	9.38	9.31	0	12.45	0.70	0	8.48	3.64
2	Feb.01	0	0	9.04	1.31	2.38	16.39	3.68	5.12	13.67
3	Mar.01	0	0.37	15.16	3.35	2.96	13.64	5.45	2.55	2.83
4	Apr.01	0.94	0	4.51	0.53	0.45	1.44	1.97	0.20	0
5	May.01	0	0	2.39	0.25	0.12	2.14	4.81	0	7.44
6	Jun.01	4.53	0.50	2.37	8.05	0.99	5.11	1.09	0	3.58
7	Jul.01	11.35	3.21	7.54	9.74	2.14	1.75	4.53	4.49	11.47
8	Aug.01	6.51	3.69	9.20	6.06	1.19	6.86	1.48	6.21	7.33
	<b>Total:</b>	23.31	17.14	59.53	29.3	22.68	48.03	23.01	27.01	49.95

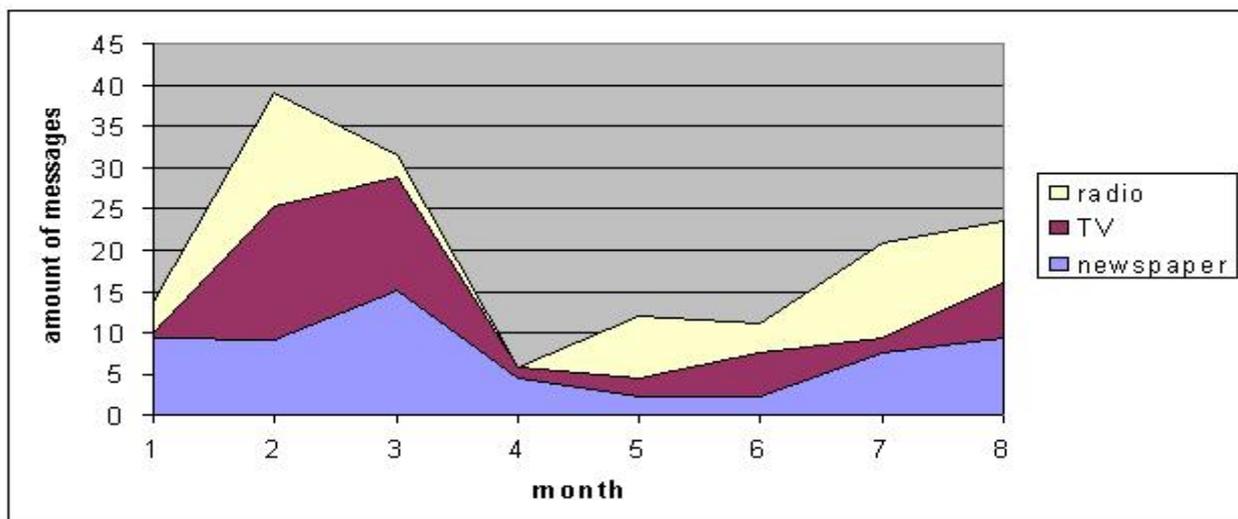
Correlation among the TV, radio channels and “Fakty i kommentarii” newspaper in their general attitude to NATO is evident from graphs 4.1- 4.3.



Graph 4.1. Distribution of positive messages during the period studied (Jan – Aug 2001)



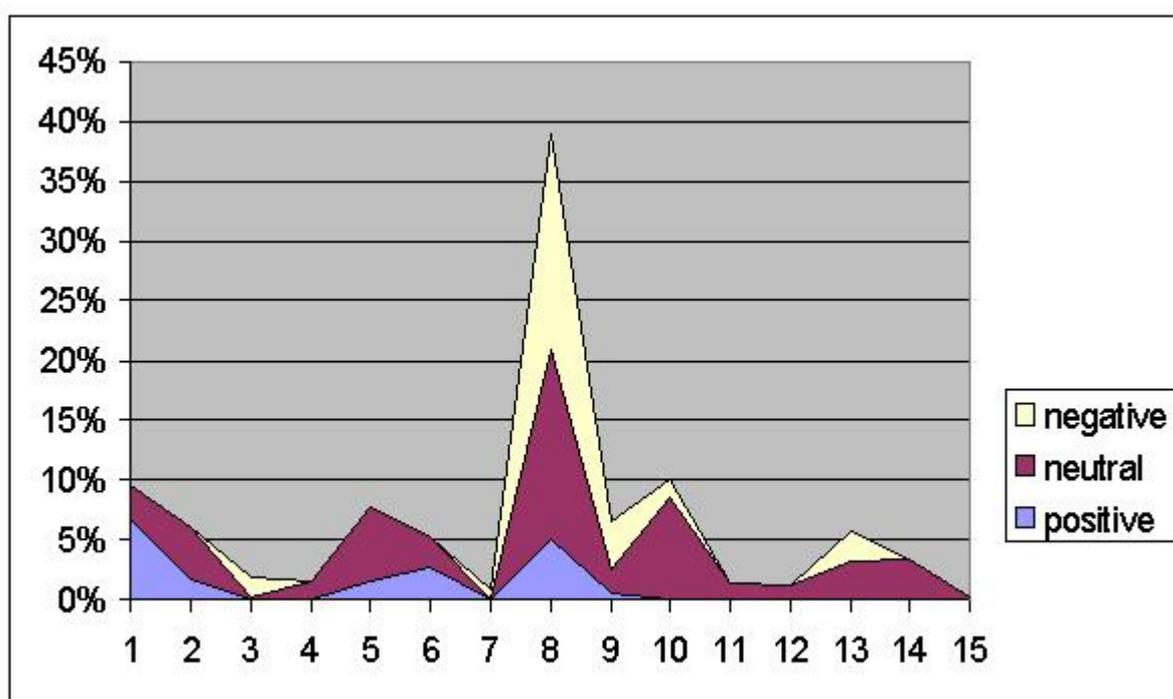
Graph 4.2. Distribution of negative messages during the period studied (Jan – Aug 2001)



Graph 4.3. Distribution of neutral messages during the period studied (Jan – Aug 2001)

*The perceptible unanimity of TV, radio and press can be explained by the state influence on mass media, which is still rather strong in Ukraine.* As Dmitry Vydrin writes, "the influence of the state authorities on mass media is always stronger (and more perceptible) than even the influence of their owners". "Besides, in our country the system of state control over the press is higher than the level of press independence, as it was before and will be in the nearest future." ("Zerkalo nedeli". Oct. 6 2001, P.3)

Taking into account similarities in event coverage by the TV, radio and "Fakty i Kommentarii" newspaper, we considered it acceptable to extrapolate from the data obtained for the newspaper to the other two components of information domain.



Graph 4.4. General tonality of messages in "Fakty i Kommentarii" newspaper, representing the information domain of Ukraine

Numbers on horizontal axis in Graph 4.4 designate

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
March 98	May 98	September 98	October 98	November 98	December 98	March 99	April 99	May 99	June 99	April 00	May 00	June 00	September 00	October 00

### *The content-analysis results for television messages*

Neutral messages prevail among all the messages dealing with NATO (48.03% of total size of messages about NATO); 29.3% of all messages are positive, 22.68% - negative. It is necessary to note that image of NATO strongly depends on the context. Bombardments of Kosovo were accompanied by negative colouring of the Alliance image on all TV channels. NATO help after flooding in Zakarpatya got positive estimations on TV. Arrival of NATO Secretary General Lord George Robertson to Ukraine was also positively estimated with regard for the future of our country. On the diagrams, the corresponding fluctuations in the attitude towards NATO are evident. So, in January there were no positive messages about the Alliance, in July 9.74% of all messages were positive. Negative messages, on the contrary, prevailed in January (12.45%) and were practically absent in May (0.12%).

It is also necessary to note that messages concerning NATO mainly fell within the category of "information". During the period analysed, only four messages could be attributed to the category "opinion" and three messages could be attributed to "analysis" category.

33.63% of messages were accompanied by a video reportage directly from the place of events.

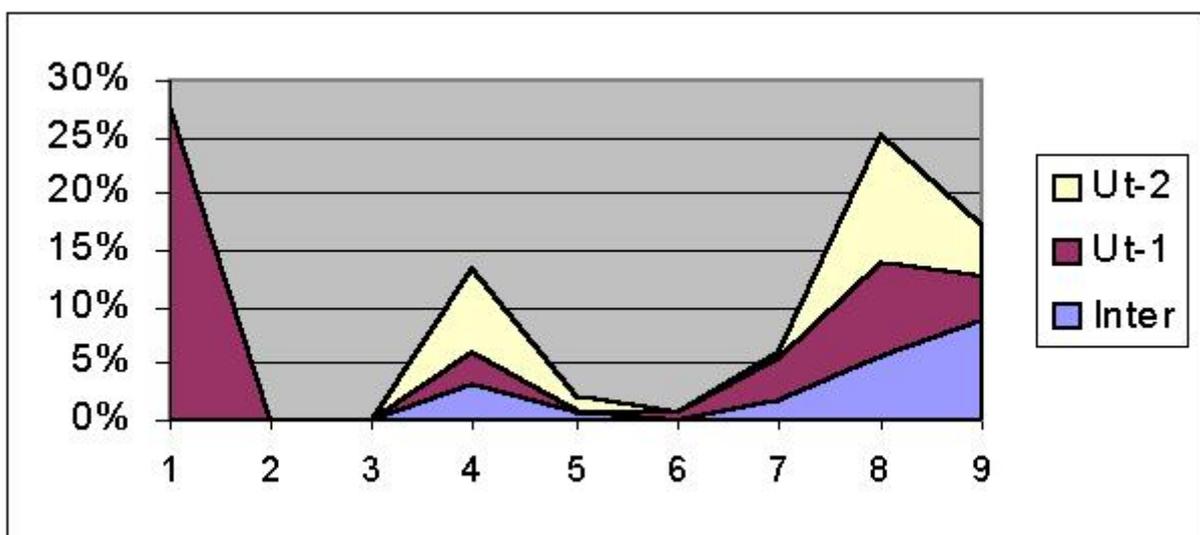
On average, there were as many as 24 messages concerning the Alliance per month. Average duration of a message was 2.18 minutes.

As we have already stated, the changes of attitude towards NATO occur faster when the messages concerning the Alliance appeal to basic human needs of safety, autonomy and financial well-being. In 1.36% of analysed messages, NATO was associated with poverty of Ukrainian people (these messages dealt with unwillingness of the Alliance to give Ukraine an opportunity to sell military and peace machinery to other countries and to receive real income from this trade). In 2.73% of messages, on the contrary, NATO was associated with prosperity of Ukraine. In 0.45% of messages, NATO image was associated with an independence of Ukraine. 1.81% of messages, on the contrary, considered the cooperation with NATO as a form of dependence; 4.09% of messages dealt with aggression of NATO, which may be turned against Ukraine; 18.18% of messages show the North Atlantic Union as a defender of interests of ordinary citizens.

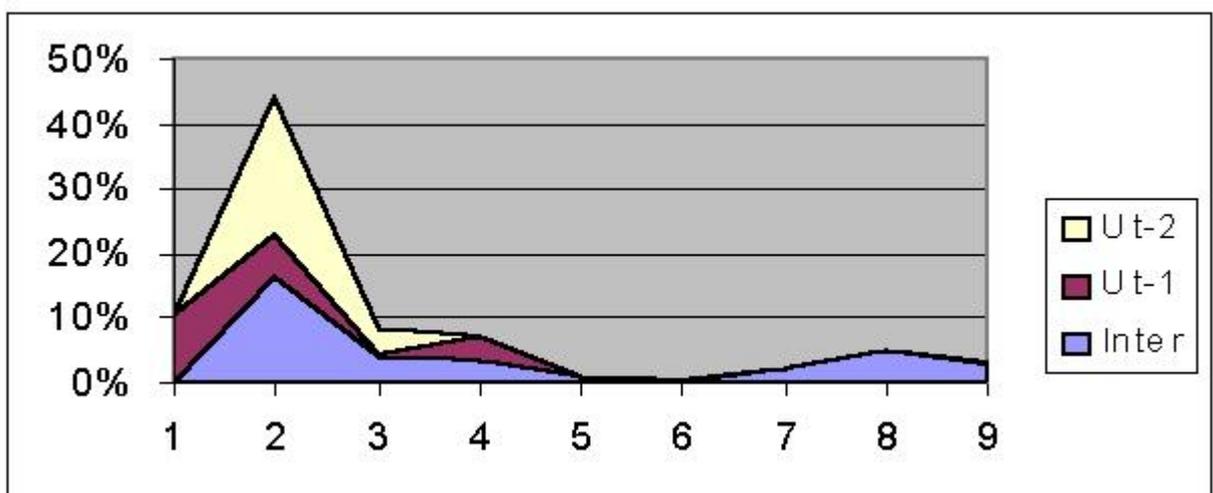
The TV domain of Ukraine is diverse enough. We tried to find out to what extent NATO image presentations by different TV channels are coordinated. The zone covered by a TV channel entirely depends on its technical abilities. In spite of numerous local broadcasting stations, the pan-Ukrainian channels (such as "Inter", "Ut-1" and "Ut-2") are certainly the leaders in TV space. Besides, local TV channels pay more attention to local problems coverage rarely dealing with international events. Therefore, we have found it possible to study only messages of above-mentioned central channels omitting rare messages of other ones. Further, we grouped messages by

month of broadcasting, calculated the ratio of the positive, negative and neutral messages displayed in each month on each TV channel.

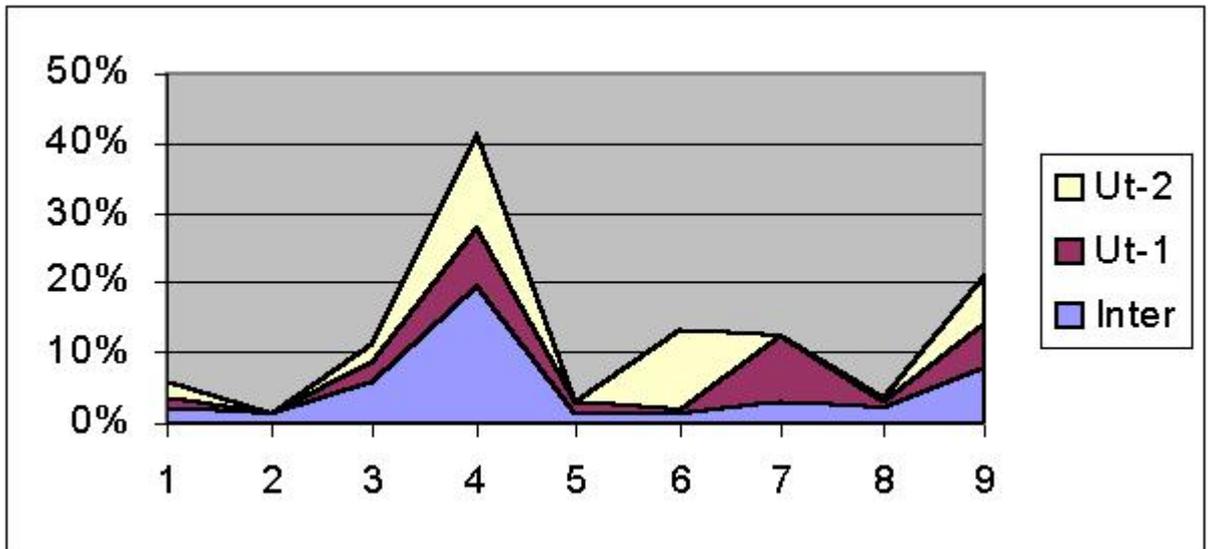
It clearly displayed in diagrams that extreme points (maximum and minimum) of message sizes are achieved practically at the same time for different channels; this extreme points are connected with certain events where NATO is involved directly or indirectly. Though some deviations can be observed, generally all three channels cover the same events identically. Thus to some extent we can claim the existence of universal TV information domain in Ukraine. This certainly can only be assumed for the purpose of current research because we proved this universality only in the system of measures developed for the purpose of current project.



Graph 4.5. Distribution of positive messages on main TV channels  
(Dec 2000 (#1) - Aug 2001 (#9))



Graph 4.6. Distribution of negative messages on main TV channels  
(Dec 2000 (#1) - Aug 2001 (#9))



Graph .4.7. Distributions of neutral messages on main TV channels  
(Dec 2000 (#1) - Aug 2001 (#9))

#### ***The content analysis results for radio messages***

Almost the half of audio messages was neutral. Positive and negative messages are 23% and 27%, correspondingly.

Small information reportage prevails among audio messages. From 135 messages only, one could be attributed to "analysis" and two – to "opinion". On average, each message lasts 1.25 minutes. On average, 15 messages were transmitted per month.

Appealing to basic human needs is even less frequent in audio messages than in TV ones. Namely 11% of all messages inspire the feeling that NATO aims to protect the listeners, 6.67% of messages associate activity of NATO with aggression, 1.48% of messages associate NATO with Ukrainian dependence from the West, 0.74% of messages associate NATO with financial well-being of Ukraine, no messages appealing to independence problem were detected.

Generally, it is necessary to note, that radio perform the function of informing of the population much more successfully, that can not be stated about the function of public opinion formation concerning various actual problems. In other words, the radio channel did nothing to develop positive attitude of Ukrainian population towards NATO.

*The content-analysis results for printed mass media*

The relation among positive, neutral and negative messages about NATO in selected newspapers is summarized in table 4.7.

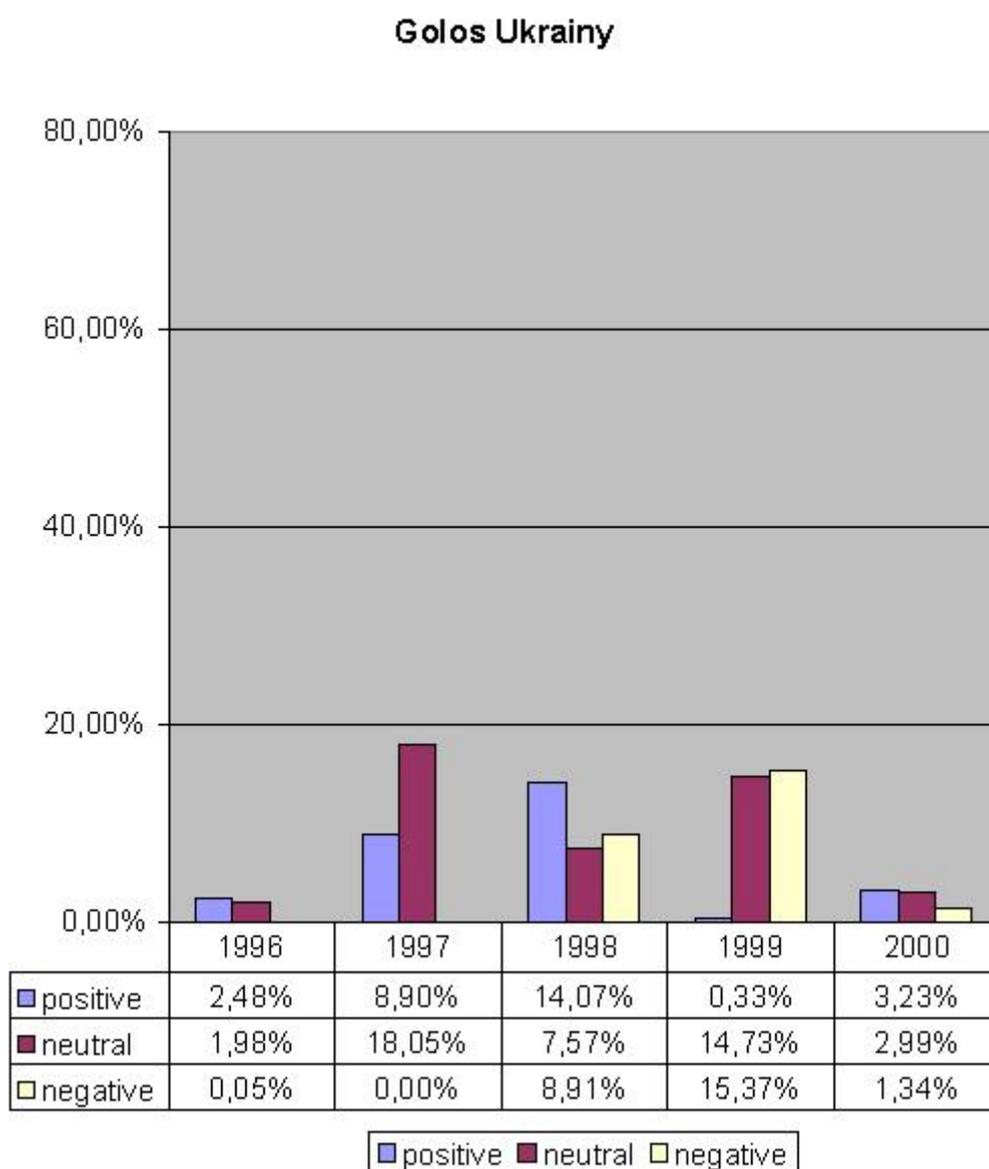
**Table 4.7. The relation among positive, negative and neutral messages in press during 1996 – 2000**

<b>Newspaper</b>	<b>Positive</b>	<b>Neutral</b>	<b>Negative</b>
<i>Golos Ukrainy</i>	29.01%	45.32%	25.67%
<i>Vremia</i>	2.3%	47.8%	49.6%
<i>Selskie Vesti</i>	5.3%	24.1%	70.6%
<i>Vecherniy Kharkov</i>	0.0%	31.0%	69.0%
<i>Argumenty i Fakty</i>	6.2%	57.4%	42.4%
<i>Kommunist</i>	0.22%	1.73%	98.05%
<i>Fakty i Kommentarii</i>	18.14%	53.00%	28.86%
<i>Segodnia</i>	14.18%	53.71%	32.12%
<i>Den</i>	14.17%	64.92%	20.91%
<i>Nezavisimost</i>	10.51%	64.04%	25.45%

The analysis of the printed mass media for the period of 1996 - 2000 is given below.

**"Golos Ukrainy"** – the organ of Verkhovna Rada (issued since 1990).

"Golos Ukrainy" newspaper was the most positive in writing about NATO. In 1998, there were two times as much positive messages as negative and neutral ones. In 1996-1997, negative messages were not detected. "Golos Ukrainy" had the greatest percent of positive messages about NATO (29.01%) among all the newspapers we studied. In addition, it is the only newspaper where the portion of positive messages is greater than the portion of negative ones if taken for the whole period studied.

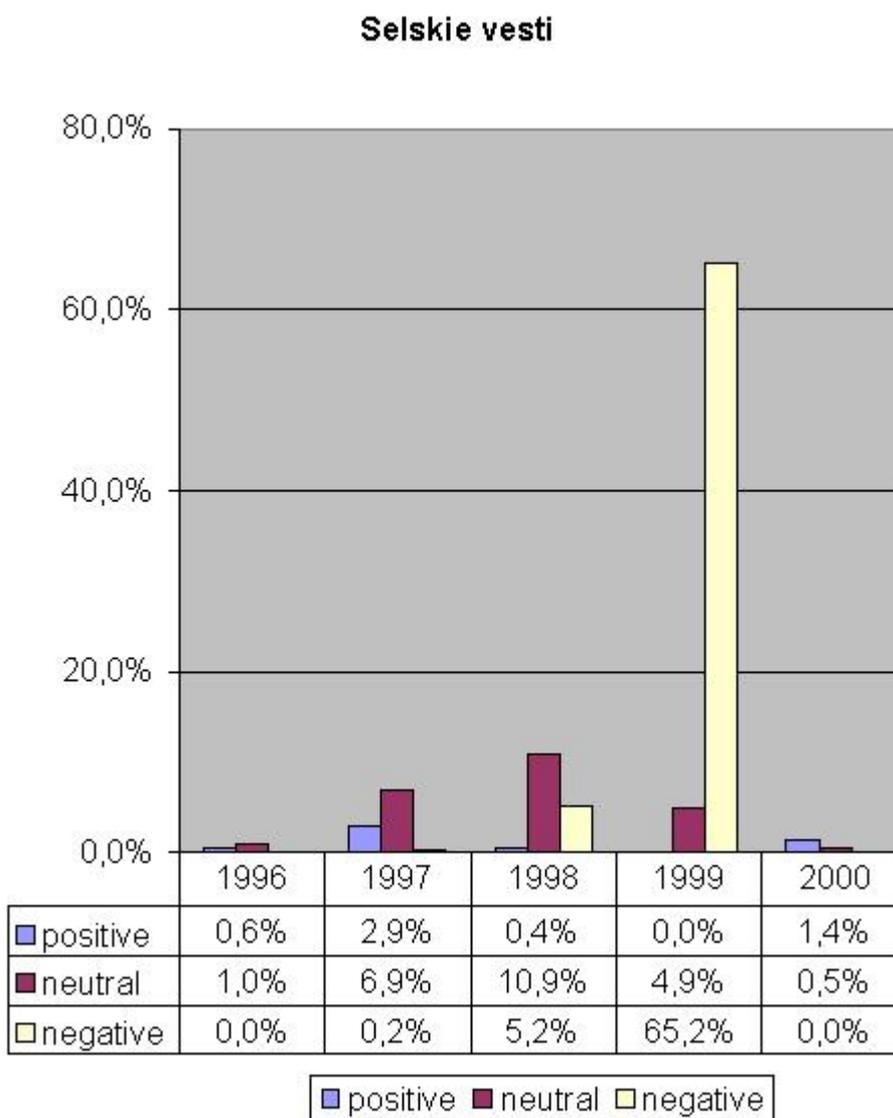


Graph 4.8. Distribution of different kinds of messages in newspaper "Golos Ukrainy"

"**Selskie Vesti**" - a newspaper expressing the interests of rural population.

Negative messages prevailed here (70.6%) due to their sharp increase in 1999.

The maximum number of negative messages was published in 1999 – the year of NATO military actions in Yugoslavia (65.2%). The portion of positive messages about the Alliance is very small (5.3%). However, in 2000 there was a positive tendency.



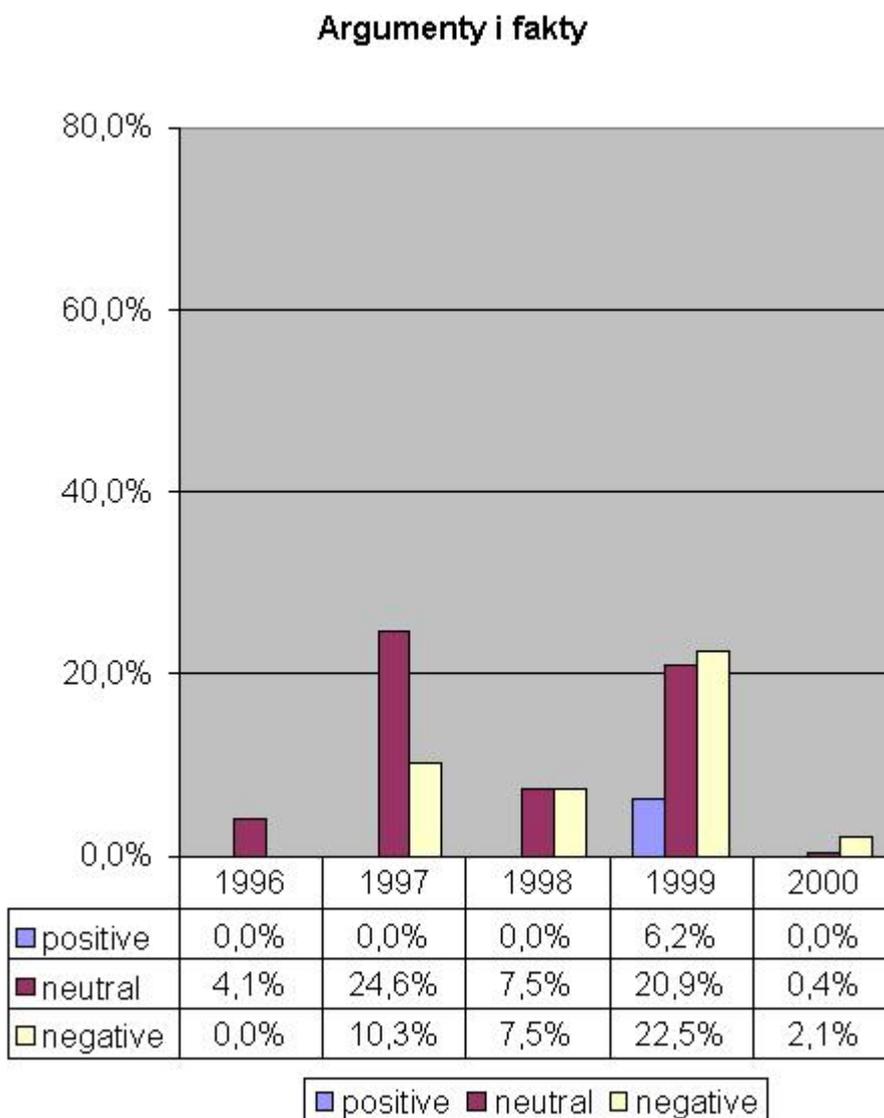
Graph 4.9. Distribution of different kinds of messages in newspaper "Selskie Vesti"

"Vecherniy Kharkov" - a regional newspaper - abounds with negative messages concerning NATO (69%). The greatest number of them fell on 1999 too. This is the only paper with absolutely absence of positive messages (0.00%) published in selected period.



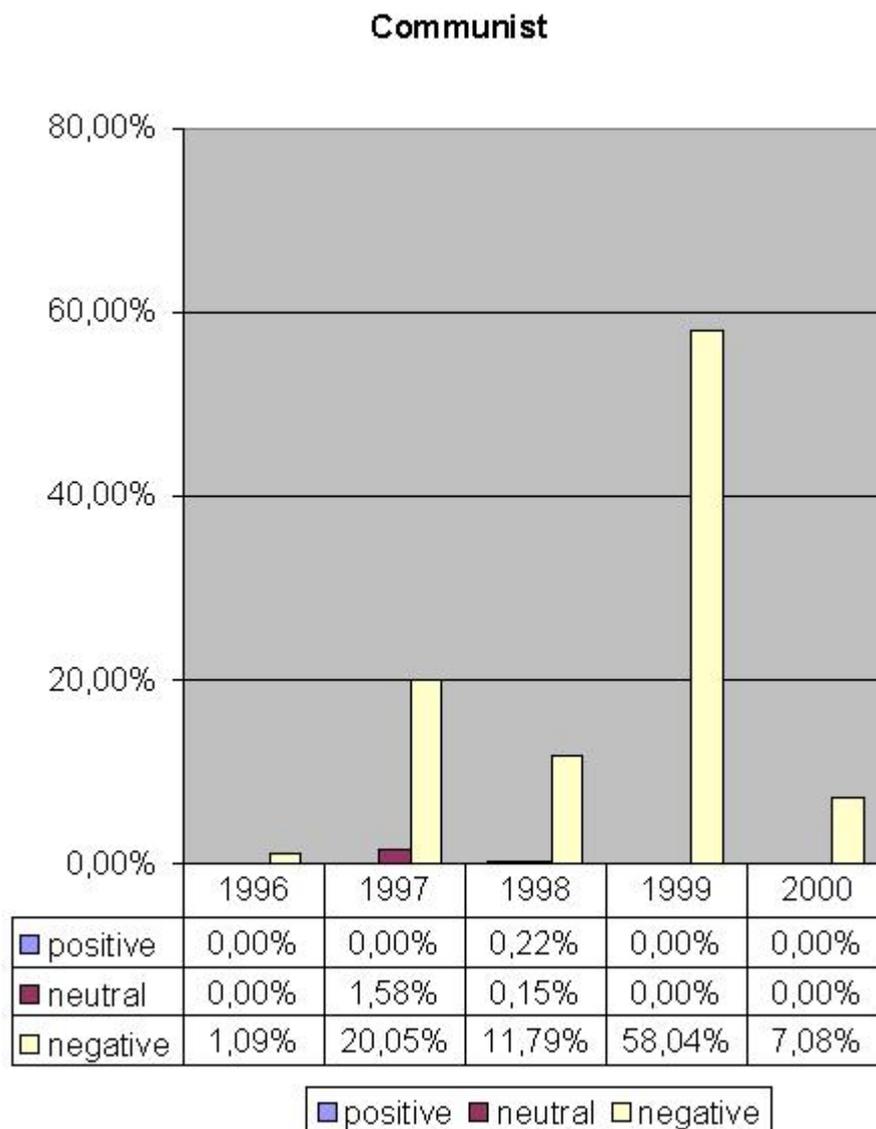
Graph 4.10. Distribution of different kinds of messages in newspaper "Vecherniy Kharkov"

In "Argumenty i Fakty" newspaper negative and neutral publications about NATO prevail (57.4%), the portion of positive messages is very low (6.2%). The maximum for neutral messages was detected in 1997 (24.6%). Negative messages prevail in 1999 and 2000.



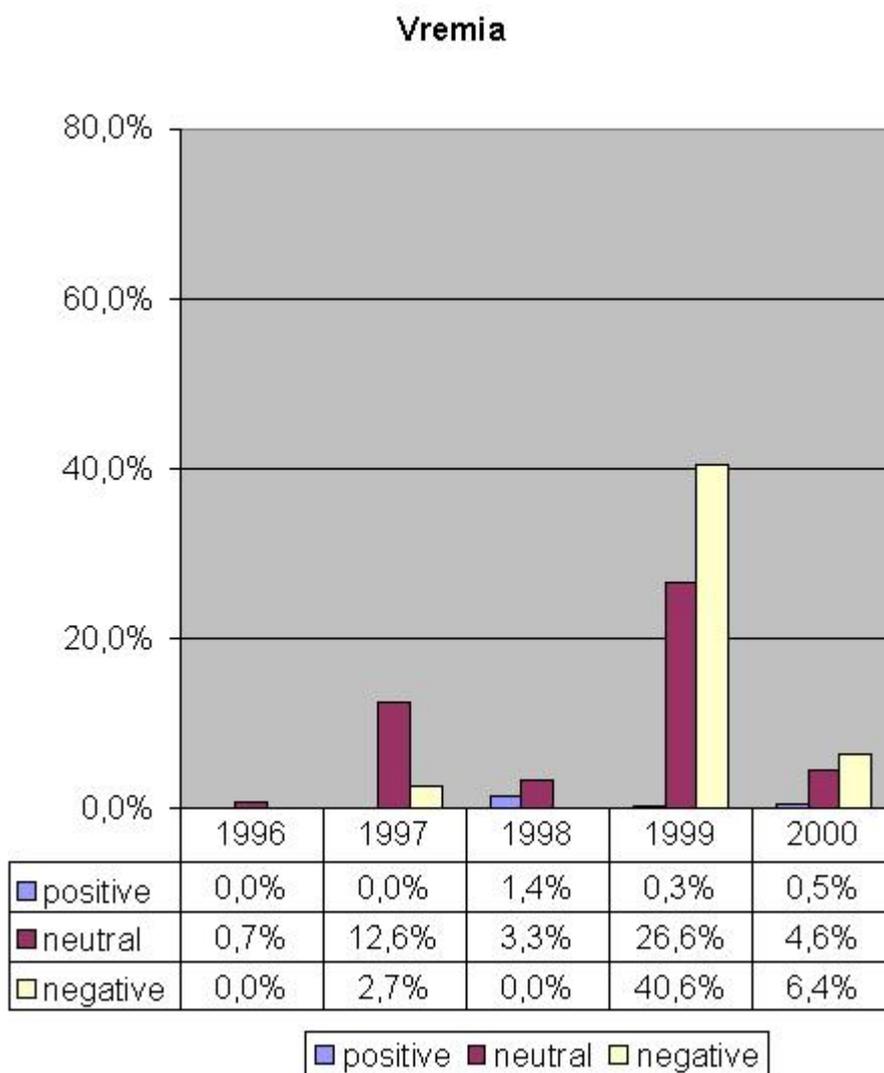
Graph 4.11. Distribution of different kinds of messages in newspaper "Argumenty i fakty"

**"Communist"** newspaper is the organ of Communist Party of Ukraine. Communist Party agitates for alliance with Russia and restoration of the Soviet Union. It is natural that negative messages about NATO prevail here (98.05%) and positive ones were practically absent (0.22%). Dominance of negative messages and low level of positive messages is characteristic for every year. A negative peak, as in other newspapers, was detected during 1999. Therefore, it can be said that the attitude to NATO expressed in these newspapers remains negative and was extremely negative during the military campaign in Yugoslavia.



Graph 4.12. Distribution of different kinds of messages in newspaper "Communist"

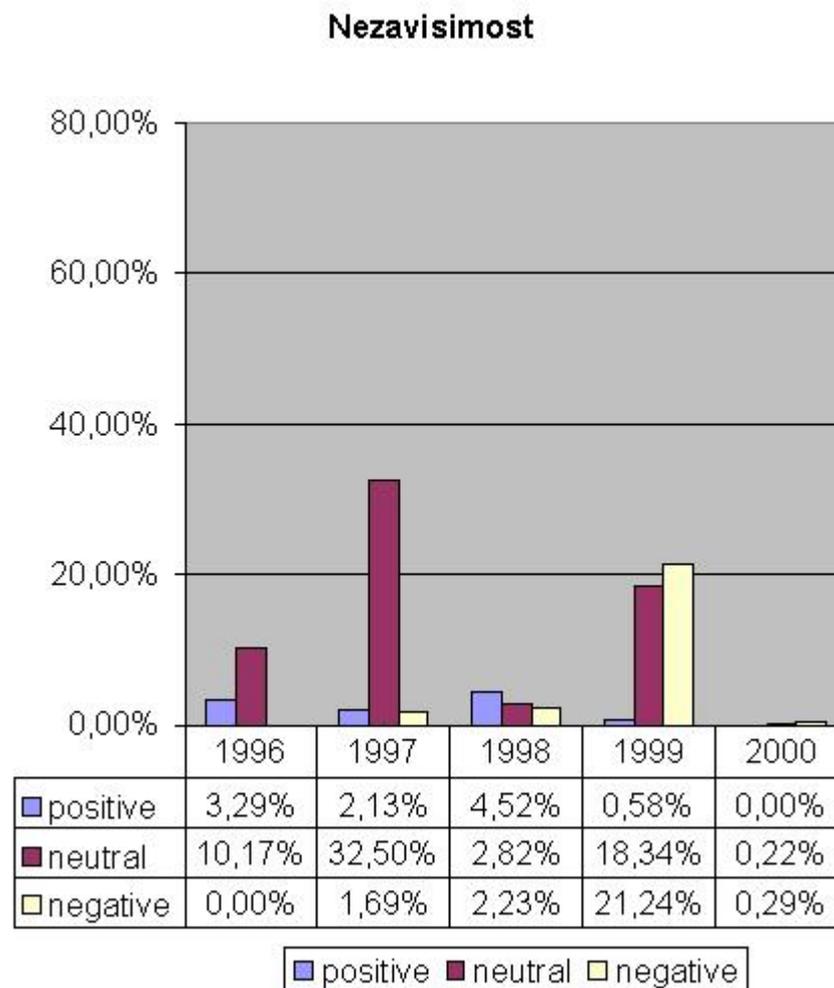
"Vremya" - a regional newspaper - is characteristic for very low number of positive messages about the Alliance (2.3%), while the numbers of negative and neutral messages are practically equal (49.6% and 47.8% correspondingly). The peak of negative messages also was in 1999.



Graph 4.13. Distribution of different kinds of messages in newspaper "Vremia"

"**Nezavisimost**" is a newspaper oriented towards rightist audience.

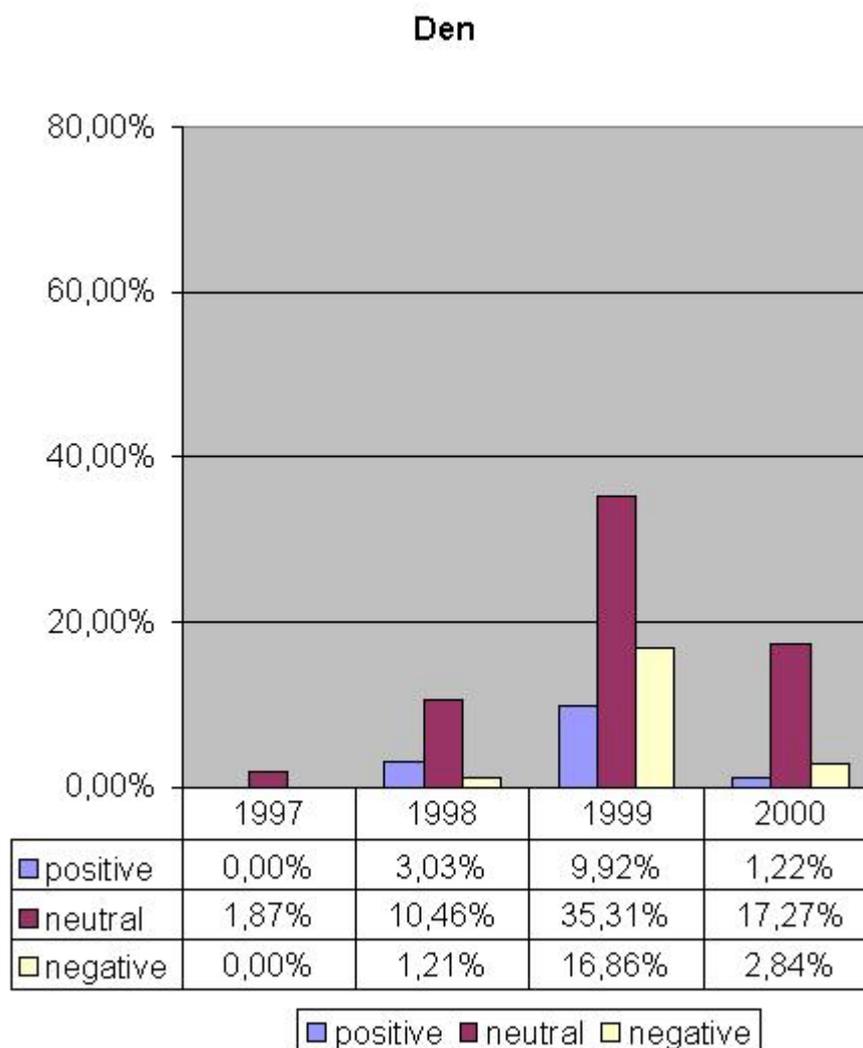
In patriotically oriented "Nezavisimost" neutral messages prevailed (64.04%). In 1998, there was dominance of positive messages, which is rare for Ukrainian press. In general, this newspaper was characteristic for low level of negative messages (25.45%).



Graph 4.14. Distribution of different kinds of messages in newspaper "Nezavisimost"

“Den” is a newspaper oriented towards centrist audience.

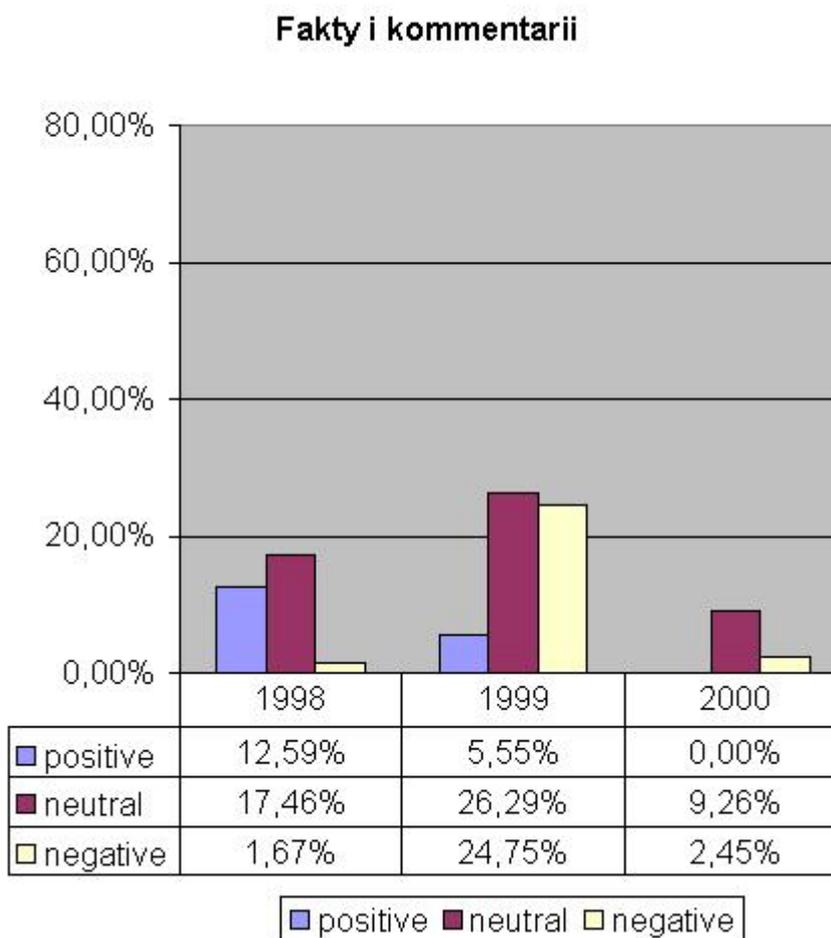
In centrist “Den” neutral messages about NATO dominated (62.92%). This dominance was observed during the whole period studied. It can be explained by realistic, balanced position of the newspaper aiming at objective interpretation of events even in 1999. It is interesting that the level of negative messages is lower here (20.91%) in comparison with other newspapers.



Graph 4.15. Distribution of different kinds of messages in newspaper “Den”

**“Fakty i Kommentarii”** – a central government (and pro-presidential) newspaper.

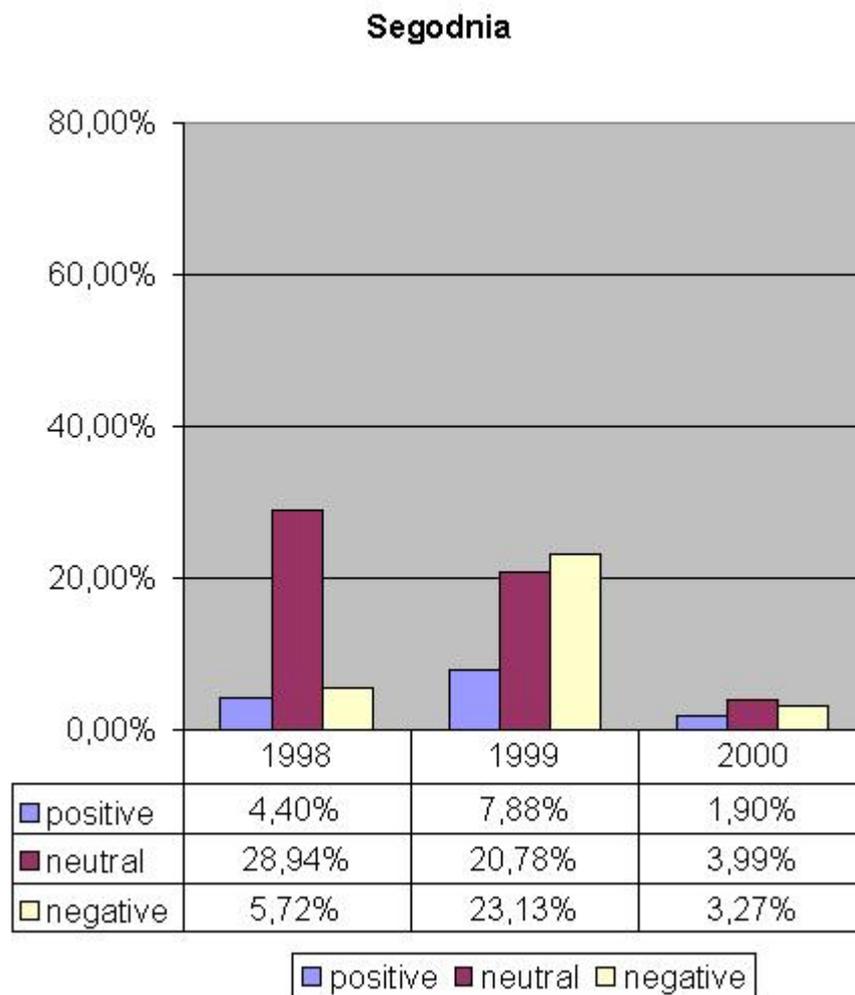
Gradual decrease of the number of positive messages about NATO and dominance of neutral messages (53%) are characteristic for "Fakty i Kommentarii". The peak of negative messages was observed in 1999, but, in general, neutral messages prevailed there.



Graph 4.16. Distribution of different kinds of messages in newspaper “Fakty i Kommentarii”

In "**Segodnya**" newspaper, which has a large circulation, the portion of neutral messages gradually declined during 1998-2000, nevertheless they prevailed (53.91%). The level of negative messages was the highest in 1999 (23%) as in other newspapers, but the level of neutral messages was too high enough there (21%).

It was in 1999 when a peak of negative messages about NATO was observed in all mass media. This can be seen in graphs (graph 4.4 and graphs 4.8 – 4.17)



Graph 4.17. Distribution of different kinds of messages in newspaper "Segodnia"

Finally, we should conclude that chosen set of printed mass media gives a sufficient picture of the spectrum political orientations while dominant part of the information domain belongs to TV.

## 5. THE RETROSPECTIVE ANALYSIS OF NATO IMAGE IN UKRAINIAN MASS MEDIA\*

Before Ukraine became independent, NATO was regarded by mass media of Ukraine (being that time a part of the USSR) as an alien and extremely aggressive force.

1991 – 1994. Key points: Ukraine became independent; it declared status of neutrality and status of nuclear-weapon-free-state. International journalism in Ukrainian experienced the period of the formation and its attention was almost completely concentrated on the relations with Russia (a problem of the Black Sea fleet, sharing of assets and liabilities of the former Soviet Union). The image of NATO was practically absent in materials of the Ukrainian mass media. *The positive moment was the termination of anti-NATO propaganda.*

1994. Upon eliminating nuclear weapon people, authorities and mass media came to realize the full absence of guarantees of safety of Ukraine. Ukraine looked for a chance of getting such guarantees. Ukraine joined NATO "Partnership for Peace" program (Jan 11 1994). During this period, population of Ukraine obtained actual information about the Program and NATO. Though being not very intensive *this information flow brought mostly positive image of NATO.*

1995 - 1998. Mass media actively presents NATO as essentially new structure aimed at maintenance of peace and stability on the continent. This attitude is stimulated by the strain of relations with Russia, on one hand, and active development of relations with the Alliance on the other. Since the end of 1994 "NATO Office of Information and Press" (Brussels) conducted set of activities for Ukrainian journalists, sponsoring their business trips to NATO Headquarters in Brussels, participation in various symposiums, meetings, exchanges etc. As a result, the majority of the Ukrainian mass media, except for leftist press, tried not to stress participation NATO forces in the conflict in Yugoslavia. Deterioration of press attitude to NATO followed the plan of NATO expansion to the East and the threat of nuclear weapon being placed in proximity of the borders of Ukraine, on the territory of new member states. After the promise of Brussels not to place nuclear weapon here in peacetime, the tension decreased. That is why since 1996 willingness of political authorities to make NATO-Ukraine relations official became evident and got support in Ukrainian mass media. In this period, the official statements of Ukrainian high-rank officials about possibility for Ukraine to join NATO appeared; the mass media actively propagate the idea of special Ukraine – NATO partnership and the rightist press told about the necessity of joining the Alliance. New tension in relations

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\* The authors are very thankful to journalist Ms. Victoria Vlasenko for supplying us with her Ph.D. theses results concerning some aspects of NATO-Ukraine relation coverage in different newspapers during 1991-1997.

with Russia resulted from military exercises "Sea Breeze - 97" (March 1997). The Alliance actively supported the propaganda. There were invitations of Ukrainian journalists to Brussels, demonstration of advantages of integration of Ukraine into European structures, opening "NATO Centre for Information and Documentation" in Kyiv (May 1997). Ukrainian-NATO Special Partnership Charter was signed on July 9, 1997 in Madrid.

Regional press pays rather limited attention to the problems of Ukraine – NATO relations. ***The tonality of regional press changed from neutral (1996) to negative (1997) and unconditional support in 1998.***

Central newspapers ("Argumenty i Fakty", "Fakti", "Nezavisimost", "Den") paid much more attention to these problems. Pro-government press ("Golos Ukrainy") was the most positive in its estimation of the Alliance.

It is possible to conclude, that ***the Ukrainian mass media managed to eliminate stereotypes of the former image of NATO established during the Cold War and to introduce new its image to the population of Ukraine.*** In 1997 for the first time during the period analysed the amount of people positively estimating NATO has exceeded the amount of those with negative estimations. Sociological interrogations detected at the time of the Charter signing that most part of Ukrainian population did not perceive the Alliance as an aggressive and hostile organization any more. The same researches reported low level of the population awareness about the Alliance. As many as three quarters of the population knew nothing or did not know enough about NATO. Though the amount of those who wished joining NATO at that moment was high enough (about 30%), the whole situation was unstable because less than ten percent of the population had enough knowledge about NATO. It became clear one year later during the events in Kosovo.

1999. It is the year of radical changes in the attitude of Ukrainian population to NATO. It was influenced by NATO bombardments of Yugoslavia. There was significant difference in reaction of Ukrainian mass media on those events. ***The government-oriented newspapers tried to weaken the inevitably growth of negative estimation sharply reducing amount of materials about the Alliance.*** Nevertheless, the tonality of NATO-related publications became negative in all newspapers, differing only by the rate of rejection of NATO policy.

In general, it can be said that the contents of the Ukrainian mass media during the period of 1991-1998 were determined by the following factors (in reverse order of their importance).

- Character of relations with Russia;
- Reaction of Ukrainian authorities to the political situation;
- Informational policy of NATO (in 1994-1995);
- Real actions of NATO as military and political organization.

Most part of central press is positive towards NATO during this period. (It is necessary to emphasize concurrence in tonality of printed mass media and TV in the West-related issues). ***The mission to present the Alliance as essentially new European structure was fulfilled by Ukrainian mass media.*** Year 1999 had partially destroyed this new image of NATO. The Alliance policy in Yugoslavia presented by mass media revived the old stereotypes about aggressive essence of NATO. The Alliance is regarded as an instrument of Western politics and aggression for the most part of Ukrainian population.

The year 2000 brought some positive tendency. It might seem that the positive image of the Alliance is gradually restored but it hardly was so. The previous success was the result of joined efforts of Ukrainian authorities, Ukrainian mass media (at least the central media) and NATO information actions. Military activities of the Alliance have destroyed the image created. Its re-creation by old means is hardly possible. Moreover, stabilization in relations with Russia eliminated one of the major determinants causing Ukrainian orientation to the West.

As follows from paragraph 4.3, the fruitful Ukraine-NATO collaboration taking place either in military (Partnership for Peace program, peace-keeping missions in Kosovo and Macedonia) or humanitarian sphere (assistance in repairing after natural and technological catastrophes, support for scientific researches, social aid to retired servicemen, etc.) was not adequately covered by the media, while they paid much attention to the Yugoslavian campaign, which was rather unpopular in Ukraine. It can be assumed that the influence of these informational factors resulted in the increase of negative attitude to NATO among Ukrainians, as it is shown in chapter 5. So, the ***present attitude to NATO among the population of Ukraine can be explained not only by the Cold War rudiments or by the influence of Russian mass media but by the failure of the policy for integration with NATO process support in Ukrainian mass media, declared in President Kuchma's Edict #1209 (November 1998).***

The ***new informational strategy should be applied to "rehabilitate" NATO among the most part of Ukraine population. One of key points of this strategy is the holistic image of the Western world with its basic components - the Council of Europe, the European Community and NATO.*** In addition, as far as integrating into this reality is still desirable for the significant part for the Ukrainian population (totally 42.8% according to the interrogation conducted by Ukrainian centre of Economic and Political research in August 2001) it can become powerful drive for NATO support in Ukraine. In this strategy, the Alliance represents itself as not the main purpose, but as means of achievement of more significant purpose (integration in Europe).

## 6. THE ANALYSIS OF GROUP DYNAMICS

The Ukrainian population's attitude to NATO is based on an individual's or a group's choice of several significant alternatives, namely:

- orientation towards Russia or towards the West;
- planned or free market economy;
- small independent state or powerful state formation (as Soviet Union or the European Community).

In its turn, a number of social and psychosocial features of individuals influence this choice. Among the most significant features are nationality, age, education, region of residence, settlement type, level of income, social position, etc. Choosing the strategy of informational influence on people one should take into account as many these factors as possible.

**Nationality.** Taking into account that about 95% of Ukrainian population are Ukrainians and Russians, it was sufficient for our task to consider these two ethnic groups only. Russians usually support preservation, restoration and strengthening of the connections with Russia. Therefore, Ukraine orientation towards NATO is perceived negatively and even considered as a threat. For Ukrainians, especially with a high level of national identity, orientation towards NATO is a real chance to preserve independence of the country, a guarantee of defence from more powerful Russia, a pre-condition for Western help and support in various spheres.

**Age:** in general the older a person is the greater is one's mistrust and rejection of NATO. It can be explained by the following reasons.

- Stereotypes of Cold War dominate of in people of older generation. They associate NATO with the concepts of "enemy", "danger", etc.
- Their mental rigidity makes them more resistant to PR-technologies and to the influence of mass media, trying to change their orientation.
- Many elderly people associate pro-Western orientation of Ukraine with catastrophic decrease in their incomes and life standards.

The following is characteristic for youth:

- absence of any Cold War stereotypes concerning NATO;
- propensity to changes and innovations;
- adherence to democratic values;
- absence of life experience making them liable to the influence of PR-technologies;
- perception of Western countries (and NATO) as a real chance to satisfy their ambitions (in education, business, etc.).

**Education.** Generally, the higher is the educational degree of an individual the more positive he/she is towards the West (and towards NATO) because:

- stronger is the individual's tolerance (personal as well as cross-cultural);
- greater is the knowledge about the advantages of European societies;
- greater are one's chances to implement their life plans within Western culture;
- broader are one's opportunities to get help from Western organizations - grants, exchange trips, invitations to conferences etc;
- greater is one's feeling of being underestimated in Ukraine in comparison with the Western standards;
- better is one's knowledge of foreign languages, which is especially significant.

**Social status.** Positive attitude towards the West also depends on how much the West is associated with one's prosperity.

*Social groups positively estimating Western orientation:*

- significant part of the establishment, seeing in it a guarantee of preservation of independence of Ukraine and their status in the state;
- significant part of intelligence, especially in the capital, being earlier "in shadow" of their Moscow or Leningrad colleagues;
- those businessmen whose business interests are connected with the West;
- the personnel of the companies with Western capital or working with Western partners;
- post-graduate students, having a chance to move abroad.

*Social groups negatively estimating Western orientation:*

- most pensioners;
- most former qualified employees of military industry, having lost their workplaces and higher social status;
- workers of coal industry;
- unemployed and other social groups, whose status has considerably decreased during the period of reforms in Ukraine.

**Region of residence.** Western regions of Ukraine tend to be more positive towards the West, including the possibility of joining NATO. It is caused by:

- historical connections with the West; this regions formerly belonged to various Central European states;

- higher level of national consciousness of the population considering NATO as a guarantor of independence of Ukraine;
- religious and cultural unity;
- wider participation of the population of these regions in economic relations with foreign countries;
- closer connections with Ukrainian Diaspora;
- prevailing agrarian sector of economy made the separation from Russia less painful for these regions than for Eastern and Southern ones where industrial sector of economy prevails;
- lower density of Russian population.

**Settlement type.** The smaller is the settlement the worse it is provided with information (including quality of education, communication and mass media), thus country residents tend to be alien to "global problems". In addition, the country population is more inertial and more adhere to traditions in comparison with urban population.

Following the logics implemented in the inventory, we distinguished the following subgroups of Ukrainian citizens (Table 6.1), according to the answers to principal questions (Chapter 3.1).

**Table 6.1 Principles of subgroup distinguishing**

№	Response to question 1	Response to question 2	Features of subgroups	
1	Agree	Disagree	Such responses demonstrate different rate of positive attitude towards NATO	Absolutely positive
2	Agree	It is hard to say		Rather positive
3	It is hard to say	Disagree		Rather positive
4	Disagree	Agree	Such responses demonstrate different rate of negative attitude towards NATO	Absolutely negative
5	Disagree	It is hard to say		Rather negative
6	It is hard to say	Agree		Rather negative
7	It is hard to say	It is hard to say	Such responses demonstrate different rate of vague attitude towards NATO	Vague
8	Disagree	Disagree		Avoiding the choice
9	Agree	Agree		Ambivalent

Trying to optimise data analysis we have united the extracted subgroups in three categories. So, the category of the respondents with positive attitude towards NATO comprised subgroups 1, 2 and 3, the category with negative attitude towards NATO comprised subgroups 4, 5 and 6, and the category with vague attitude towards NATO comprised subgroups 7, 8 and 9.

In further analysis, we paid attention to the following factors.

Static factors

- Ratio of respondents with positive and negative attitude towards NATO in a group.
- Absolute number of respondents with vague attitude towards NATO in a group.
- Relative amount of respondents with vague attitude towards NATO in a group.

Dynamic factors

- Standard deviation in amount of respondents with positive and negative attitude towards NATO in a group during the whole period.
- Standard deviation in amount of respondents with vague attitude towards NATO in a group during the whole period.

Having analysed groups from the point of view of these factors, we came to conclusion, that the following kinds of groups should be targeted in developing a strategy of informational influence:

- largest groups (because informational influence on these groups may provide NATO with significant amount of supporters);
- dynamic groups (with high indices of standard deviation; because such groups can be easier influenced than stable ones);
- groups with a high number of people who have vague attitude towards NATO (because it is easier to change the attitude of such people to positive);
- groups where positive attitude towards NATO is dominant among their members (they do not demand additional efforts from informational technologists).

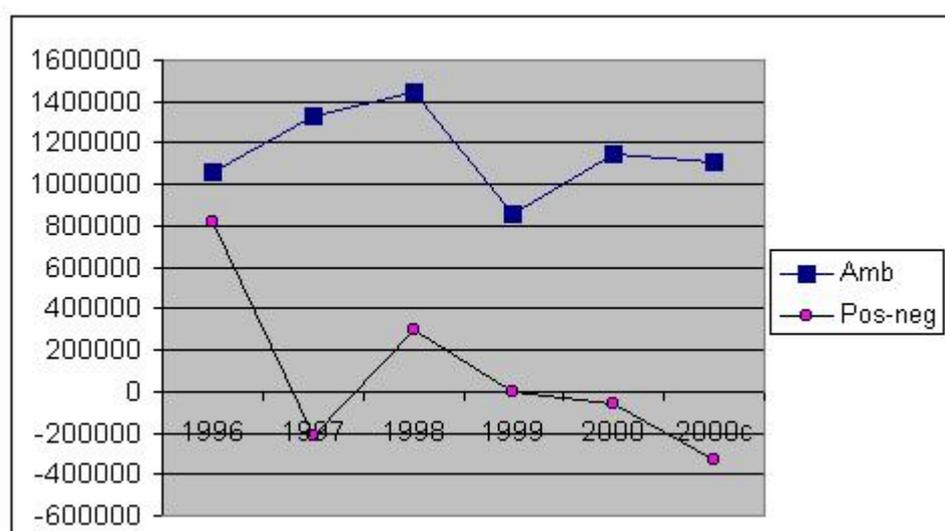
The groups where negative attitude towards NATO dominates should not be considered when planning informational strategy because the efforts they require does not correspond to the results that can be achieved.

## 6.1. The largest groups description

Table 6.2 The largest groups

№	Code	Sample	Total size (in Ukraine)	Group features
3	1113	170	3 979 570	<u>High portion of people with vague attitude towards NATO</u>
2	1112	99	2 320 000	<u>High portion of people with vague attitude towards NATO</u>
26	2132	99	2 319 380	<u>High portion of people with vague attitude towards NATO</u>
27	2133	97	2 270 550	<u>High portion of people with vague attitude towards NATO</u>
21	2113	91	2 124 066	<u>High portion of people with vague attitude towards NATO</u>
8	1132	86	2 002 000	<u>High portion of people with vague attitude towards NATO</u>

1. The group consists of Ukrainians, living in “pro-Ukrainian” regions in villages, more than 50 years old. Graph 6.1 features the dynamics of this group<sup>1</sup>. Generally, we can describe this group as rather negative towards NATO with stable negative dynamic during the last three interrogations (starting from 1999).



Graph 6.1. The dynamics of group 1113

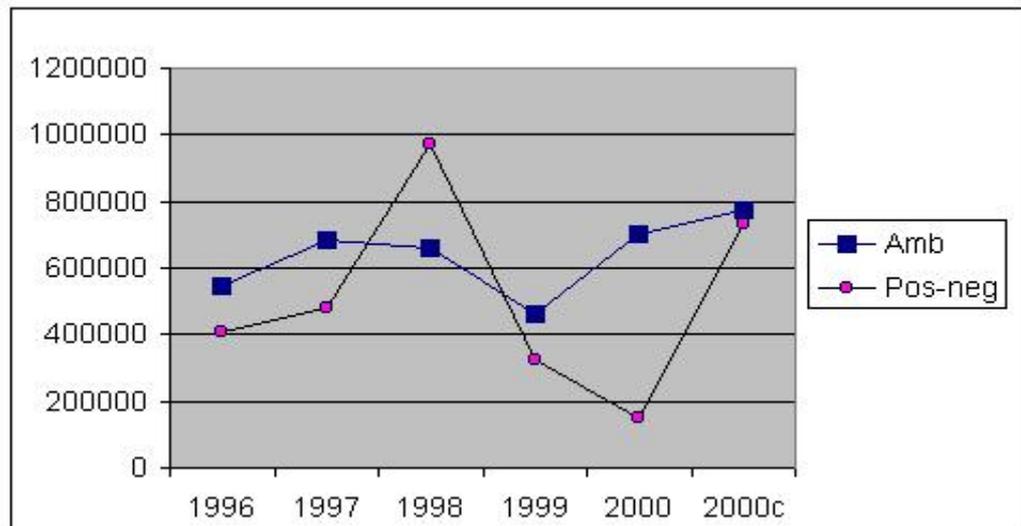
The significant parameters of the group are *region, settlement type and age*. Declaration of independence and European orientation of Ukraine inspired a hope on fast growth of prosperity in peasants. However, the subsequent crisis resulted in sharp decrease of living standards of this social group. Thus, the dynamics of the group's attitude to NATO reflects the process of losing illusions concerning fast improvement of life in Ukraine. The burst of positive attitude to the Alliance in

<sup>1</sup> “Amb” curve represents the dynamics of amount people who have vague attitude towards NATO; and “Pos-Neg” reflects general dynamic of the amount of positively and negatively oriented people (each point is obtained as a result of subtraction the amount of negatively oriented people (NEG) from the amount of positively oriented people (POS)).

1998 is typical for the whole society and is connected with preparation and signing of government Partnership Program approved by president Leonid Kuchma.

*The Group is not promising for targeted influence of mass media.*

2. The group consists of Ukrainians, living in “pro-Ukrainian” regions, in villages, 30 – 49 years old. Generally, we can describe this group as positive towards NATO with positive dynamic during the last two interrogations (starting from Jul 2000).

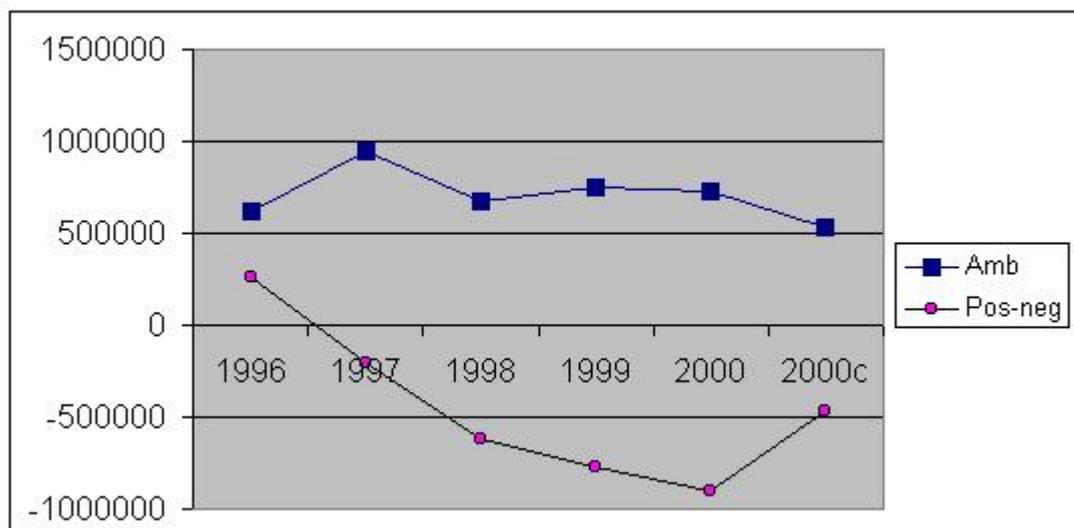


Graph 6.2. The dynamics of group 1112

The significant parameters of the group are *region and age*. Positive balance preservation in the attitude towards NATO even in 1999 and its sharp rise during 2000 reveal strong disposition towards the West. It can be explained by the fact that many members of the group are integrated in economical life of European countries as seasonal, part time workers, etc.

*The group is promising for targeted informational influence.*

3. The group consists of Ukrainians, living in “centrist” regions in cities, 30 – 49 years old. Generally, we can describe this group as negative towards NATO with stable negative dynamics during the whole period of observation, while amount of people with vague attitude towards NATO being constantly high.



Graph 6.3. The dynamics of group 2132

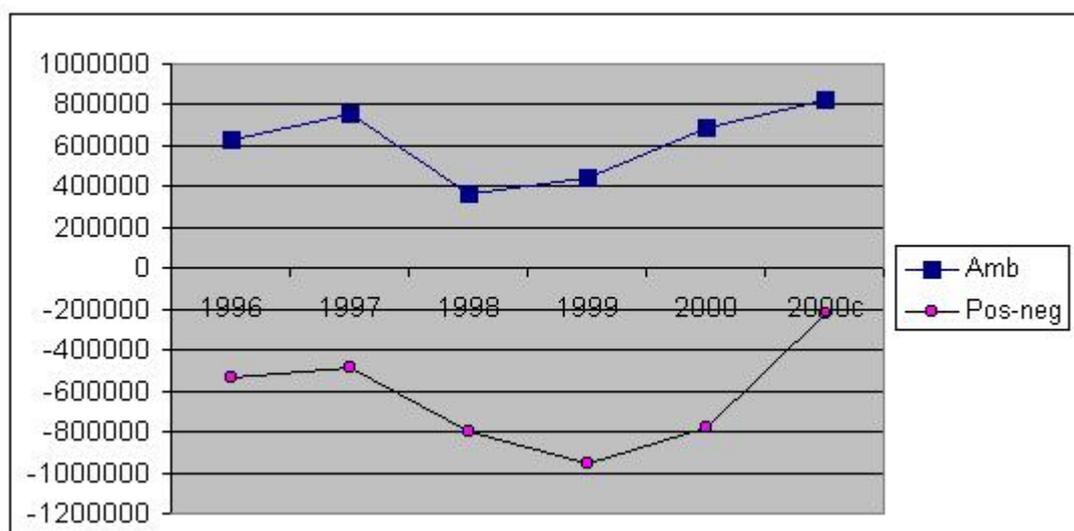
The significant parameters of the group are *age, settlement type and region of residence*.

The attitude dynamics in this group partly coincides with the dynamics of group 1113 above. This group consists of inhabitants of industrial cities suffering from deep industrial crisis. The course of European integration declared in early 90s and separation from Russia are considered among the main causes of the crisis.

*The successful informational strategy for this group should be based on demonstrating positive examples of economic cooperation with Western European countries.*

4. The group consists of Ukrainians, living in “centrist” regions in cities, more than 50 years old.

The general picture of this group is similar to that of the previous one.



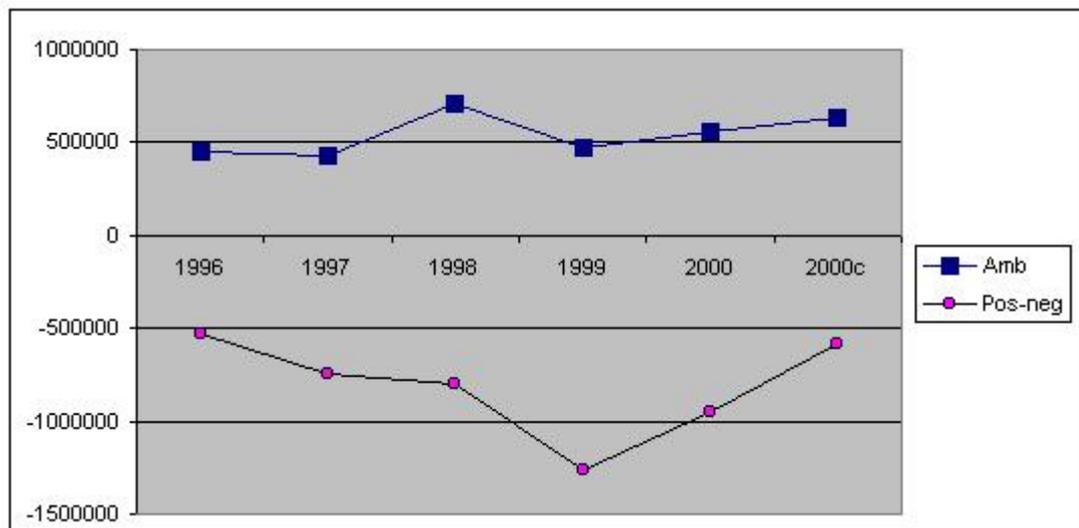
Graph 6.4. The dynamics of group 2133

The significant parameters of the group are *age and settlement type*.

Old age in this group can be the reason for stable domination of the negative attitude towards NATO. Increase of positive attitude in 2000 can be explained with a combination of socio-economic factors, such as regular payment of pensions, some progress in economy, and the activity of mass media - this group is an active consumer of information product.

*To information influence this group, messages should concentrate on advantages for Ukraine to join Europe, and positive examples of cooperation with European states.*

5. The group consists of Ukrainians, living in “centrist” regions, in villages, more than 50 years old. The general picture of this group is similar to that of two previous groups. This group can be described as negative towards NATO.

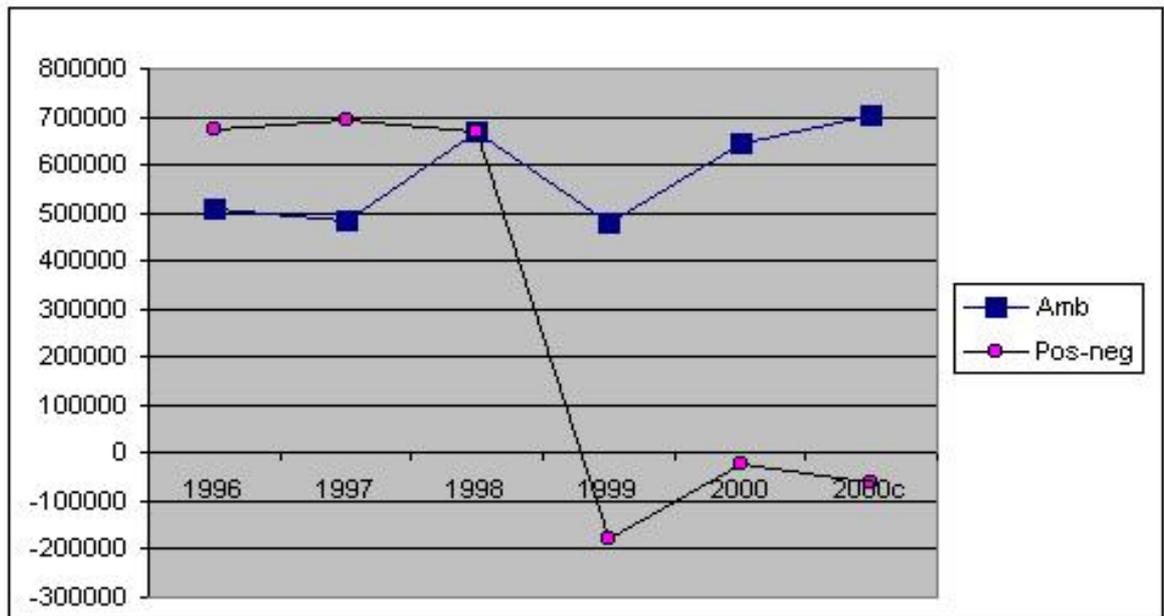


Graph 6.5. The dynamics of group 2113

The significant parameters of the group are *region of residence, settlement type and age*. The deep crisis of agrarian sector of economy stimulates nostalgia about former times including the revival of former stereotypes concerning the image NATO. It determined stable negative estimation of the Alliance amplified in 1999. Positive dynamics in 2000 may be explained with some stabilization of economy, easing social and economic tension and activity of mass media.

*Targeted influence of mass media can support the weak tendency of improvement of the attitude towards NATO.*

6. The group consists of Ukrainians living in “pro-Ukrainian” regions in cities 30-49 years old. Here attention should be paid to sharp change of the attitude in 1998-1999. Previously being positive towards NATO this group became charged with negative attitude.



Graph 6.6. The dynamics of group 1132

The significant parameters of the group are region of *residence, settlement type and age*. Radical change in its attitude reveals the high importance of democratic ideals for the group members. The West was regarded as symbol of democracy and positive estimation of NATO was connected with this. Moreover, NATO bombardments in Yugoslavia were considered as violation of democratic ideals. Negative attitude towards NATO remains here until year 2000.

*The group is prospective for targeted informational influence. Military actions of the Alliance have had negative impact on the group, but there still are other powerful factors mentioned earlier that determine this group's support to European integration of Ukraine.*

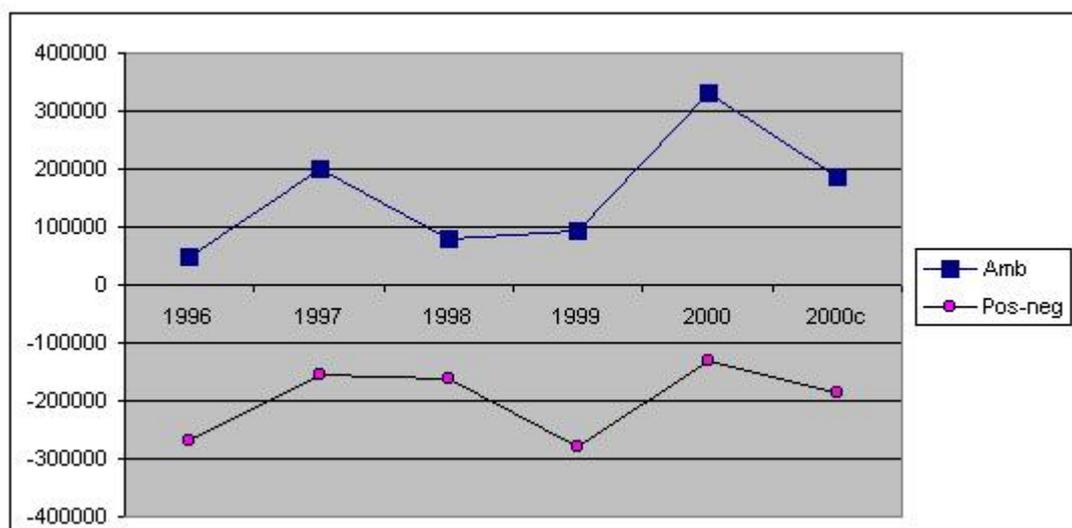
The group requires well-reasoned presentations regarding joining NATO not as the main purpose, but as the means of integration to Europe. The information materials showing achievements and advantages of European integration should prevail.

## 6.2. Dynamic groups

Table 6.3. Dynamic groups

№	Code	Sample	Total size (in Ukraine)	Features of the group
41	3122	20	460 000	There is clear dynamics of the amount of people with vague attitude towards NATO
12	1213	20	463 870	There is clear dynamics of the amount of people positive and negative towards NATO
17	1232	19	439 460	There is clear dynamics of the amount of people positive and negative towards NATO
50	3222	18	415 050	There is clear dynamics of the amount of people positive and negative towards NATO
33	2223	16	366 220	There is clear dynamics of the amount of people positive and negative towards NATO

1. The group consists of Ukrainians living in “pro-Russian” regions, in towns, 30-49 years old. This group can be described as negative towards NATO with no tendency towards improvement.

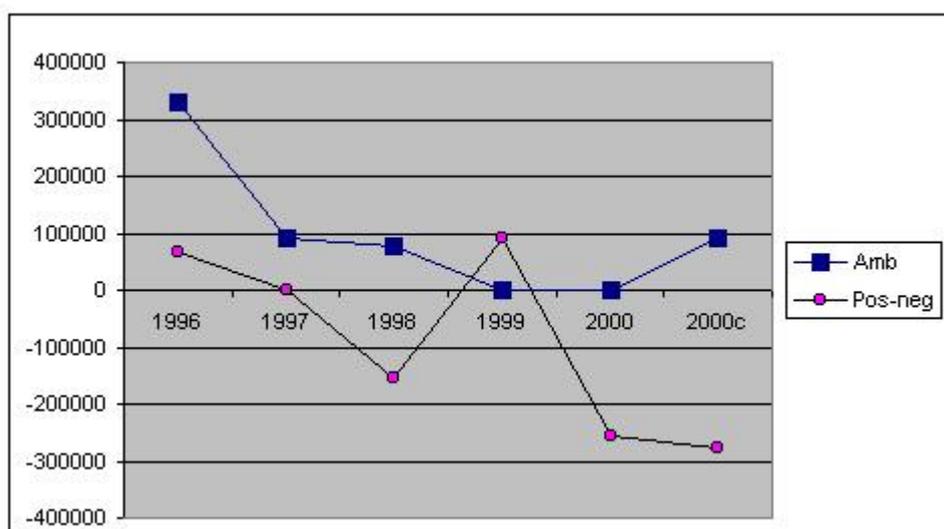


Graph 6.7. The dynamics of group 3122

The significant parameters of the group are *region of residence, settlement type and age*. General negative attitude is caused by pro-Russian (i.e. anti-NATO) orientation, additionally strengthened in urban population by industrial the crisis. *At the same time, the group is liable to mass media influence*. Returning in 2000 to the level of 1997-1998 is connected both with the beginning of stabilization in economy, and with activity of mass media.

2. The group consists of Russians, living in “pro-Ukrainian” regions in villages, more than 50 years old. The seeming paradox of the dynamics of this group should be mentioned. While Kosovo events elicited strong negative response from the absolute majority of Ukraine citizens in this group we observe sharp upraise of positive attitude towards NATO namely in this year. This fact can be explained by some sympathy to the Albanians forming in Serbia national minority, as Russians, living in pro-Ukrainian regions do.

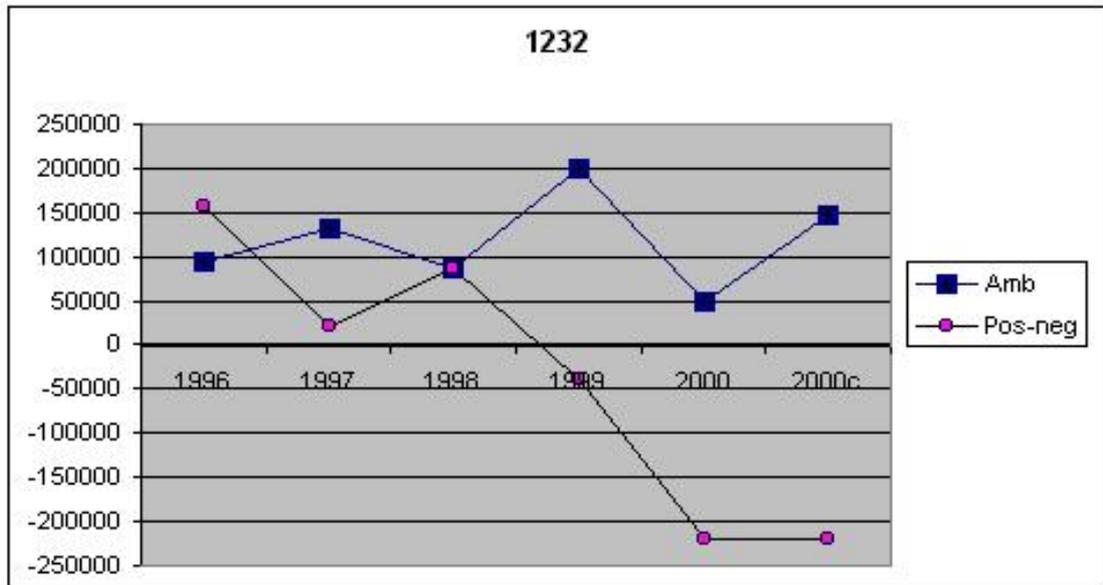
*In general, this group is negative towards NATO.*



Graph 6.8. The dynamics of group 1213

The significant parameters of the group are *region of residence, settlement type and age*. Negative NATO image initially dominated in this group in contrast to the groups of Ukrainians living in the same regions. In addition, social and economic factors strengthened this attitude. *This group is seemingly immune to influence of mass media.*

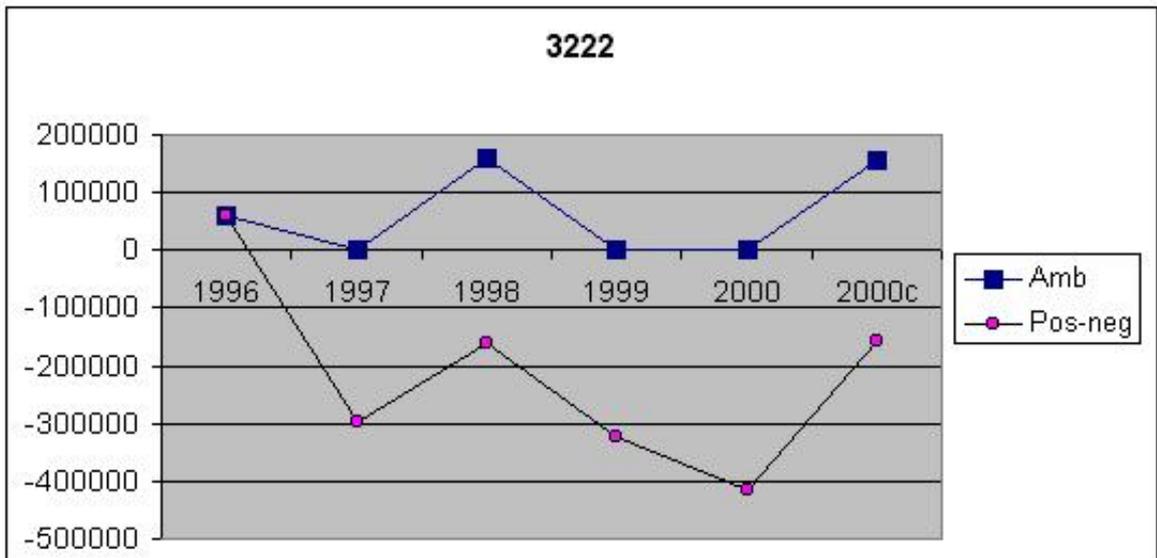
3. The group consists of Russians, living in “pro-Ukrainian” regions, in cities, 30 - 49 years old. During the whole period of observation, this group has changed the modality of its general attitude to NATO. Having been positively oriented in 1996-1998, it became negatively oriented in 1999 that, in fact, does not contradict the tendencies mentioned earlier.



Graph 6.9. The dynamics of group 1232

The significant parameters of the group are *region, settlement type and age*. The dynamics is similar to those in group 1132; *the distinction is only in primarily lower estimation of NATO and the greater susceptibility to influence of mass media (the phenomenon of 1998)*.

4. The group consists of Russians living in “pro-Russian” regions, in towns, 30 - 49 years old. Generally, this group tends to be negative towards NATO with two peaks of more positive attitude (in 1998 and in Sept. 2000).

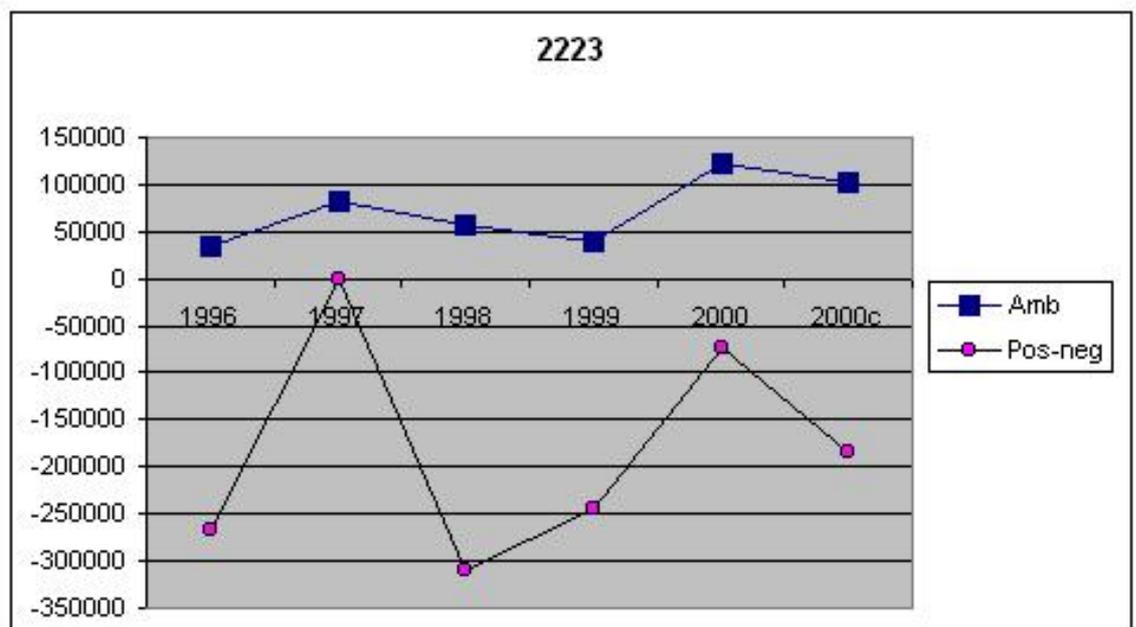


Graph 6.10. The dynamics of group 3222

The significant parameters of the group are *region, settlement type and age*.

The group is susceptible to influence of mass media, which caused the relative increases of positive attitude in 1998 and in 2000. It is prospective for mass media influence. *The consequences of events of 1999 should be neutralized by messages about current peacekeeping activities of NATO and its anti-terrorist actions (if they will not be of “Kosovan variant”).*

5. The group consists of Russians living in “centrist” regions, in towns, older than 50. While the amount of people with vague attitude towards NATO remains relatively constant, there is significant change in number of positively and negatively oriented people in this group. Two peaks of more positive attitude (in 1997 and in Jul 2000) appeared in this group.



Graph 6.11. The dynamics of group 2223

The significant parameters of the group are *region, settlement type* and *age*. General negative estimation of NATO by aged urban inhabitants living in pro-Russian and "centrist" regions was explained earlier.

It is important to note that the tendency of improvement of relations between NATO and Russia that established recently in the context of common struggle against international terrorism and international criminal groups weakens the main factor negatively influencing the attitude to Ukraine – NATO integration in “centrist” and “pro-Russian” regions because such integration was regarded as an alternative to integration with Russia.

### 6.3. Groups where positive attitude towards NATO is dominant one among their members

Table 6.4. Positively oriented groups

	Code	1996	1997	1998	1999	2000	2001
Group 2	1112	+	+	+	+	+	+
Group 1	1111	+	+	+	-	+	+
Group 4	1121	+	+	+	-	+	+
Group 7	1131	+	+	+	-	+	+
Group 5	1122	+	+	0	-	+	+
Group 25	2131	+	+	+	-	-	+
Group 6	1123	+	+	+	-	-	+
Group 17	1232	+	+	+	-	-	-
Group 8	1132	+	+	+	-	-	-

Analysing groups where positive attitude towards NATO is dominant among their members it is necessary to note that almost all Ukrainians living in “pro-Ukrainian” regions belong to these groups.

Only group 2 can be considered as “unconditionally positive” towards NATO, all others are either “critically-positive” (groups 1, 4, 5, 6, 7, 25) or “uncertain” (group 8).

- **“Unconditionally positive”** are the groups where the amount of people who agree with integration with NATO is significantly higher than the amount of those who disagree, and the dynamic of attitude does not crucially depend on concrete mass media events connected with NATO activity;
- **“Critically-positive”** are the groups that having been primarily consent with integration with NATO (in 1996-1998) then changed this attitude in 1999 and finally restored their positive attitude in 2000 (groups 1, 4, 5, 7);
- **“Uncertain”** are the groups that having been primarily consent with integration with NATO (in 1996-1998) then changed this attitude in 1999 and never restored their positive attitude towards NATO till the end of the period observed (groups 8, 17);

All these groups could constitute the skeleton of NATO support in Ukraine. Special attention should be paid to group 25; it is the only positively oriented group in “centrist” regions. The whole amount of population within these eight groups is about 13 000 000 people.

#### 6.4. Groups where negative attitude towards NATO is dominant among their members

Table 6.5. Negatively oriented groups

Code	Nationality	Group of regions	Settlement type	Age
1233	Russian	“pro-Ukrainian”	City	Older than 50
2112	Ukrainian	“centrist”	Village	30-49
2113	Ukrainian	“centrist”	Village	Older than 50
2123	Ukrainian	“centrist”	Town	Older than 50
2133	Ukrainian	“centrist”	City	Older than 50
2213	Russian	“centrist”	Village	Older than 50
2222	Russian	“centrist”	Town	30-49
2231	Russian	“centrist”	City	18-29
2232	Russian	“centrist”	City	30-49
2233	Russian	“centrist”	City	Older than 50
3113	Ukrainian	“pro-Russian”	Village	Older than 50
3122	Ukrainian	“pro-Russian”	Town	30-49
3123	Ukrainian	“pro-Russian”	Town	Older than 50
3131	Ukrainian	“pro-Russian”	City	18-29
3132	Ukrainian	“pro-Russian”	City	30-49
3133	Ukrainian	“pro-Russian”	City	Older than 50
3232	Russian	“pro-Russian”	City	30-49
3233	Russian	“pro-Russian”	City	Older than 50

Thus, the groups where negative attitude towards NATO is dominant can be characterised as follows:

- Aged Ukrainians (mainly more than 50 years old), living in “centrist” regions (groups 2112, 2113, 2123, 2133);
- Ukrainians, living in “pro-Russian” regions, mainly in cities (groups 3113, 3122, 3123, 3131, 3132, 3133);
- Russians, living in “centrist” regions mainly in cities (groups 2213, 2222, 2231, 2232, 2233);
- Russians, living in “pro-Russian” regions mainly in cities (groups 3232, 3233);

- Russians more than 50 years old (groups 1233, 3233).

Comparative analysis of positive and negative groups allowed us to draw the following conclusions:

- **positive to NATO groups** are represented mainly by Ukrainians, living in “pro-Ukrainian” regions (7 of 9 groups),
- **negative to NATO groups** – by Ukrainians, living in “pro-Russian” regions (6 of 19 groups), and Russians, living in “centrist” regions (5 of 19 groups);
- aged people dominate in **negative to NATO groups** (11 of 19 groups).

### *Chapter conclusions*

**A.** 1999, the year of NATO campaign in Yugoslavia can be considered a key point revealing the complex interrelations between NATO military and political activity, informational activity of mass media and dynamics of public opinion about NATO in Ukraine.

**B.** According to the dynamics of their attitude towards NATO, groups can be divided into following categories:

- **“unconditionally positive”** towards NATO (group 2);
- **“critically-positive”** towards NATO (groups 1, 4, 5, 7);
- **“uncertain”** (groups 8, 17);

**All other groups** follow V-shaped dynamics with peak of negative attitude towards NATO in 1999 year.

**C.** In general, **the positive groups are represented mainly by young Ukrainians, living in “pro-Ukrainian” regions while negative groups are represented mainly by aged Ukrainians, living in “pro-Russian” and “centrist” regions as well as by Russians living at the same regions.**

All above mentioned research results served as a basis for development of an expert system, which is described in next Chapter.

## **7. THE EXPERT SYSTEM DESCRIPTION**

The following operations are possible with the expert system (Fig. 7.1):

- loading, browsing and saving database tables;
- querying a database about group opinion and a newspaper's influence on a group;
- getting group opinion explanation;
- making inferences basing on the rules and facts;
- making recommendations how to influence group opinion;
- building histograms describing mass media influence on groups.

Current version of the expert system runs under Windows'98. The system is implemented using Visual Prolog 5.2.

### **7.1. Interface block**

Interface block controls all system events, windows and actions. One can initiate certain operations available by clicking the corresponding command in the system menu and submenus.

### **7.2. Help block**

Help block allows a user to understand each menu command, abbreviations used in the system and the results of system operation. The help information has hierarchical structure. Contents page is also available.

### **7.3. Database operation blocks**

These blocks allow a user to load, browse and save database tables. User can load default database or can select it from the list. After database is loaded the main menu items become enabled.

### **7.4. Query block**

It is possible to formulate and run queries to determine the measure of influence of certain message types and certain newspapers on a group – “group query”; to determine the measure of influence of certain newspaper on all groups as a whole – “mass media query”. There is a special dialog form for query input. All queries are described in paragraph 7.9 below. The query block forms query and sends it to the inference block. The inference block uses procedural knowledge to produce the answer. The system displays query results in Result window.

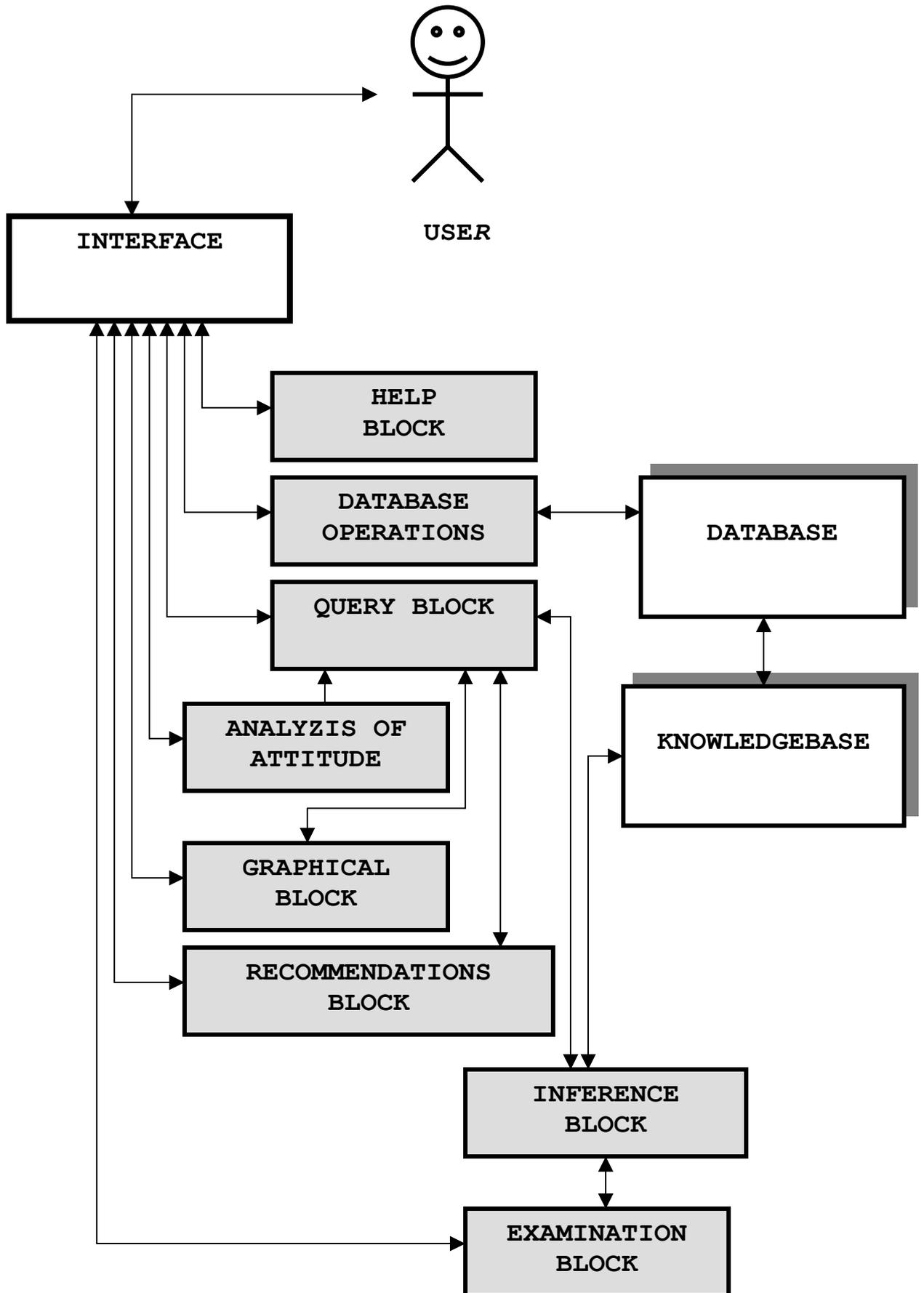


Fig. 7.1. The expert system structure

### 7.5. Attitude analysis block

This block determines the influence of certain message types and certain newspaper on a group. One can choose group number and system will display all known facts and conclusions concerning this group.

### 7.6. Recommendation block

This block analyses the reasons for certain group opinion. It determines which newspaper message has maximum positive and maximum negative influence on certain group and gives recommendations how to increase positive influence and how to decrease negative influence on a group.

### 7.7. Graphic block

Some results, e.g. the influence that all messages of various types published in certain newspaper have on certain group, can be represented in graphical form. Graphic block creates a histogram displaying all coefficients for the newspaper messages and the group. A histogram is drawn, basing on the data from query block.

### 7.8. The database of the system

The database of the expert system (Appendix 6) consists of several tables in which the following types of data are stored: regression analysis data, sociological data and some auxiliary data.

Table **TO** contains the results of regression analysis in the form:

*to (Attitude, Group\_Number, Factor\_Weight, Message\_Type, mass\_media)*

Table **GROUP** record contains group number, 4-digit group code and group size:

*group(Group\_number,1,2,3,4,Group\_size)*

Table **SPRAV** is the auxiliary table it is used to decode group code digits

*sprav( Group\_Code\_digit,Group\_code,Sign\_name)*

Table **ORIG** contains statistical data.

*Orig(Group\_number,Period\_of\_Time,Positive\_Opinion,Negative\_opinion,  
Neutral\_Opinion,Not\_Positive, Not\_Negative, Not\_Neutral)*

Table **PART\_DEF** is an auxiliary table

*part\_def(Message\_Category Message\_Category)*

In the table **READ\_ALL** the mass media titles are given.

*read\_all(Message,Regional\_Press,Communist,Selskye\_vesty,AiF,Golos\_Ukrainy,  
Fakty\_and\_Komentarii,Den,Segodnya)*

Table **SMI** contains newspaper titles

*smi(Mass\_Media\_Number,Mass\_Media\_Name)*

Table **READ\_IZDAN** contains the number of readers for each newspaper

*read\_izdan(Mass\_Media\_Name,Number\_of\_Readers)*

### **7.9. Knowledge base block**

In the expert system, two types of knowledge are represented: procedural and declarative. Procedural knowledge is used to calculate certain characteristics of public opinion basing on processing statistical data obtained from sociological interrogations, (see attitude dynamics research description). The procedural knowledge is used in query processing as well.

#### ***Procedural knowledge***

Studying mass media influence on population groups one can query a database, estimate the influence of a newspaper on an individual group or on Ukrainian population as a whole.

Two types of queries are possible:

- to determine the measure of influence of certain message types and certain newspaper on certain group – “group query”;
- to determine the measure of influence of certain newspaper on all groups as a whole – “mass media query”.

The first group comprises the following queries:

- general influence of all messages of different types in all mass media on certain group;
- general influence of all messages of different types in certain newspaper on certain group;
- influence of all messages of certain type in all mass media on certain group;
- influence of all messages of certain types in certain newspaper on certain group;

The query results are stored in res\_group.pro file. It is the program log file. It is used to generate recommendation as to the kinds of messages that should be created to get positive attitude of the population.

The second group comprises the following queries:

- general influence of all messages of different types in all mass media on all groups;
- general influence of all messages of different types in certain newspaper on all groups;
- influence of all messages of certain type in all mass media on all groups;
- influence of all messages of certain types in certain newspaper on all groups;

The query results are stored in res\_smi.pro file.

The data obtained from queries can be represented as a bar chart. When processing 1<sup>st</sup> and 2<sup>d</sup> query groups the influence of certain mass media factor on a group is weighted using regression  $\beta$ -coefficients. Later on, regression equations can also be used to get retrospective and prospective attitude analysis. This allows getting the answers to the following questions:

What number of people will change their attitude in the result of certain message type transmission?

How much the number of messages in different media should be increased to get the desirable shift in public opinion?

The total influence of mass media overall population of Ukraine is determined in the following way. For a period and for each subgroup of the population being interrogated the number of people with positive, negative and neutral attitude to NATO is determined. The following assumption has been taken: as far as the population sample is representative, its opinion can be attributed to the whole group. Consequently, the mass media influence on overall group is calculated according to the following formula

$$\text{Koef} = (\text{To1} + \text{From1} + \text{Ambi1}) / \text{Chis11},$$

where

(To1+From1+Ambi1) is the size of a subgroup, i.e. the number of people in the group being actually interrogated;

Chis11 – size of the whole group.

This coefficient is used to determine the number of people within a group having positive, negative and neutral attitude. Such calculations are done for every group with accumulation of the following values: “positive minus negative” and “neutral”. The mass media influence on population is considered positive if “positive minus negative” is greater than zero. The results are stored in the program log file.

Such estimations are done for every period and the dynamics of public opinion can be displayed in a chart.

Currently “Neutral” values are not used. Nevertheless, they can be used later in planning the policy of informational influence on certain groups and seeking for prospective kinds of influence and prospective groups.

### ***Declarative knowledge***

Declarative knowledge is used in the inference process. Declarative knowledge helps to explain public opinion dynamics during given periods. Such kind of knowledge is represented in production model. The units of knowledge are rules of the form:

**IF <list\_of\_conditions> THEN <list\_of\_conclusions>,**

Where list\_of\_conditions and list\_of\_conclusions are lexical expressions. Two kinds of lexical expressions are used as antecedents and consequents. The properties of the objects being investigated belong to the first kind of expressions (e.g., group characteristics: “region group”, “age is above 50”; opinion characteristics: “positive”, “negative”, etc.). Expressions defined by the sociologists during public opinion dynamics analysis belong to the second kind (e.g., “the group has positive opinion dynamics in 1999”, “the most dynamic group”, etc.).

The object characteristics are taken from the expert system database (see public opinion dynamics research description).

Below is a sample database fragment in Prolog:

*prav(["1111"], ["Ukrainians"]).*

*prav(["Ukrainians"], ["NATO is the chance to preserve the country independence", "NATO is the guarantee against losing Ukraine independence from Russia", "NATO is the condition for obtaining western help"]).*

*prav(["age is above 50"], ["the stereotypes of perception of NATO as an enemy, an aggressor, danger", "low receptivity to the media of another orientation", "the Western orientation of Ukrainian reforms is perceived as a main reason of decrease in living standards"]), ["negative attitude to NATO"]).*

*prav(["age is 18-28"], ["absence of mental stereotypes", "receptivity to innovations", "greater adherence to democratic values", "receptivity to mass media influence", "more chances for self-actualisation in the Western countries"]).*

*prav(["NATO is the guarantee against losing the Ukraine independence from Russia"], ["positive attitude to NATO"]).*

*prav(["NATO is the condition for obtaining western help"], ["positive attitude to NATO"]).*

The knowledge base is kept in an external file and is loaded before inference process starts.

### 7.10. Examination block

Examination block allows a user to specify initial conditions for the inference. The user can choose certain conditions from the list proposed. Examination block sends the conditions specified to the inference block and starts processing.

### 7.11. Inference block

The expert system can do inferences based on the knowledge base rules loaded and initial conditions specified by the user. The initial conditions can be selected from the list of lexical expressions comprising the expressions used in the rules.

Direct inference mechanism is employed. Thus, the system can respond to questions. When generating an answer, a direct inference chain is formed from the knowledge base rules.

Sample question:

What conclusions the system can make about group 1113 and how the opinion of group 1113 can be explained? Each answer of the system consists of a condition and a conclusion which are separated by - -- > > signs.

The user enters the lexical expression - *fact "1113"*.

The system forms the following chain of conclusions:

**1113 - -- > >**

***The settlement type – village, age is above 50***

age is above 50 --- > >

***the stereotypes of perception of NATO as an enemy, an aggressor, danger***

age is above 50 --- > >

***low receptivity to the media of another orientation***

age is above 50 --- > >

***the Western orientation of Ukrainian reforms is perceived as the main reason of decrease in living standards***

***the stereotypes of perception of NATO as an enemy, an aggressor, danger --- > > negative attitude to NATO***

***low receptivity to the mass media trying to change the orientation of the audience --- > >***

**negative attitude to NATO**

## 7.12. Directory tree

The expert system was implemented in VisualProlog 5.2. It is a freeware version with limitations on commercial usage. The system was designed as a set of separate executable units; each of them uses the database tables loaded.

The system is located in the directory ../Expert. There are two subdirectories: ../Base, ../Exe

### ***../Base directory***

../Base directory contains the subdirectories with databases. The default database is NATO.

The NATO database tables are:

def.adb - content-analysis variables;

group.adb - groups number;

orig.adb - groups attitude for the defined period;

part\_def.adb - the content-analysis categories;

prav\_rus.adb – knowledgebase;

read.adb - subgroup preferences for mass media;

read\_izdan.adb - group preferences for mass media;

smi.adb - mass media;

sprav.adb - components of groupcode;

to.adb - the  $\beta$ -coefficients.

### ***../Exe directory***

The directory ../Exe contains all executable files of the system; help file, and temporary files.

Executable files are:

expert.exe – start-up file;

w5.exe – general group attitude processing;

z1\_group.exe, z2\_group.exe, z3\_group.exe, z4\_group.exe – group requests;

z1\_smi.exe, z2\_smi.exe, z3\_smi.exe, z4\_smi.exe - mass media requests.

## 7.13. User's guide

The file expert.exe which is stored in the subdirectory ../Expert/Exe/expert.exe starts the system. After that, it is necessary to load the database.

The items of system menu:

- Working with a database;
- Examination;
- Diagrams;
- Window;
- Help.

### ***Working with a database***

Working with a database - this menu item allows to load, edit, and save data. It opens a submenu comprising the following sub-items:

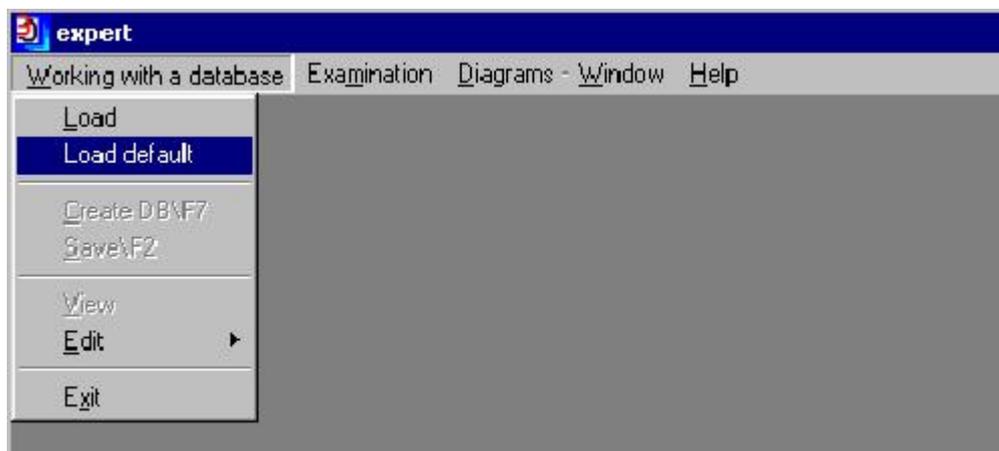
- Load - loading the data;
- Load default - loading the data from the default directory;
- Save - saving the data;
- Edit - editing current database tables;
- Exit - exiting the program.

### ***Load***

To load a database, press Browse button in Load window, select the directory with databases (the default name of the directory is Base), and select the directory with the database in question.

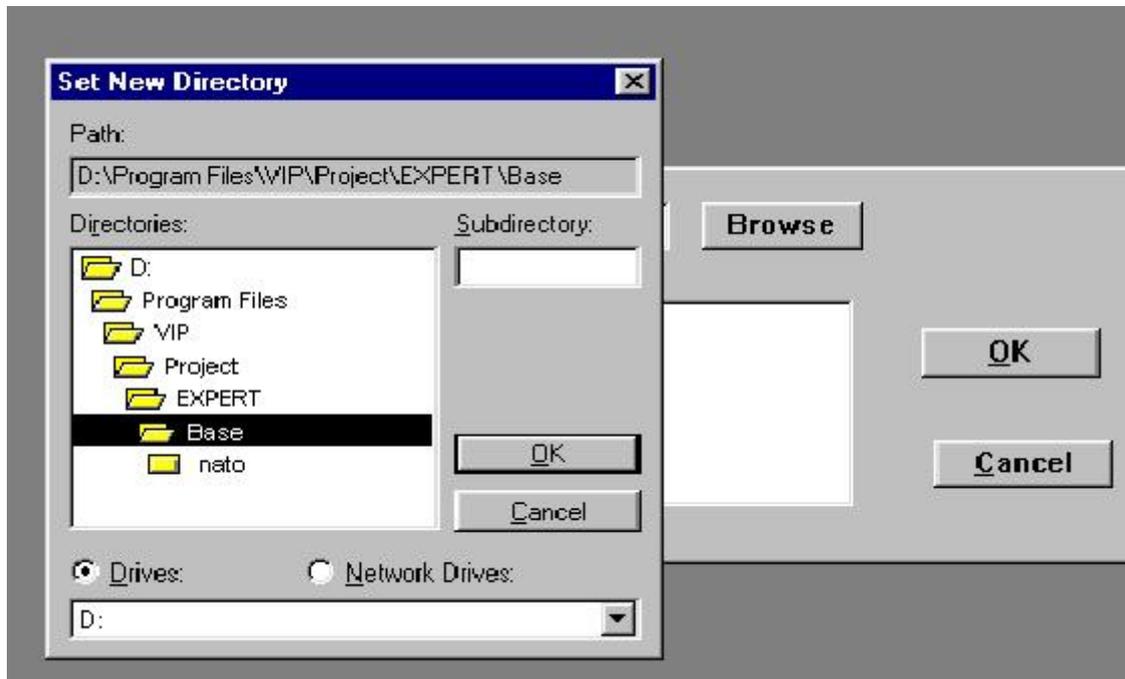
### ***Load default***

Loads the database located in Base subdirectory of home directory of the project.



## **Save**

To save a database, press Browse button in Save window, select the directory with databases (the default directory name is Base), and select the directory for the new database



## **Edit**

To edit the data, select the table in Edit menu. A window appears for data editing. Some columns are linked to other tables, and their values should be selected from the lists.

To delete a line double-click the first column and then confirm the deletion. After deleting a line close and re-open the editing window to refresh the view.

## **Exit**

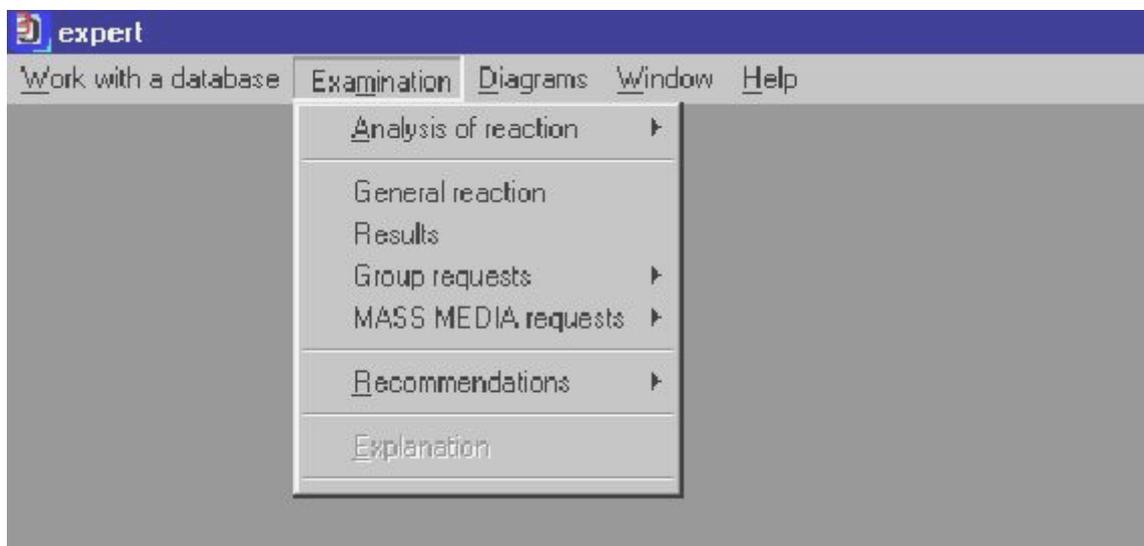
This command exits the program.

## **Examination**

This menu allows making the inferences basing on the requirements formulated.

- Analysis of reaction - the analysis of the group response to certain message types;
- General reaction - integrate group response to all messages of different types issued during certain period;
- Result - responses of groups of the population to the above-stated events separately;
- Group request - inferences from inquiries about groups;

- Mass media request - inferences from inquiries about mass media;
- Recommendations - recommendation to PR specialists;
- Explanation - generation of inference explanation for group opinion.



### ***Analysis of reaction***

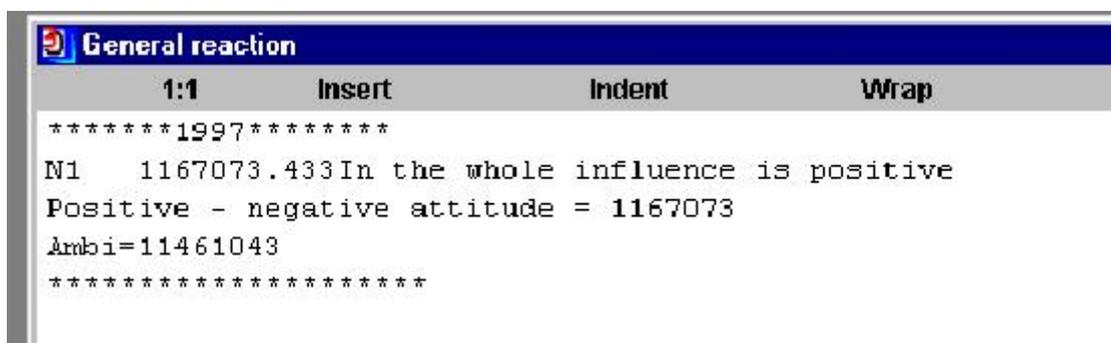
This procedure allows getting verbal explanation for causes of certain group opinion. The group number in question can be selected from the group list.

### ***General reaction***

This menu item gives an answer to the following question: "What was the integrated response of all population groups to the events of given period?)"

In the window that appears, select a period.

A window will be displayed with the data showing an integrated response of all groups. Until the end of current session, this data is temporarily stored in result2.pro file.



To see the data about each group select Examination\Result from the menu.

## **Result**

This item displays the response data obtained for each group. Until the end of current session, this data is temporarily stored in result1.pro file.

	1:1	Insert	Indent	Wrap	Read
	*****1997*****				
Group 1	Ambi=223586	Positive - negative attitude =	447172		
Group 2	Ambi=869768	Positive - negative attitude =	773127		
Group 3	Ambi=1326524	Positive - negative attitude =	1459176		
Group 4	Ambi=183857	Positive - negative attitude =	531141		
Group 5	Ambi=358080	Positive - negative attitude =	566960		
Group 6	Ambi=237170	Positive - negative attitude =	189736		
Group 7	Ambi=394941	Positive - negative attitude =	359037		
Group 8	Ambi=471674	Positive - negative attitude =	534564		
Group 8	Ambi=431287	Positive - negative attitude =	280771		

## **Group request**

This submenu deals with the inquiries about certain group. The following types of inquiries are possible.

- All message types / all mass media
- All message types / certain newspaper
- Certain message type / all mass media
- Certain message type / certain newspaper

### ***All message types / all mass media***

This item examines general influence of all messages of different types in all mass media on certain group.

### ***All message types / certain newspaper***

This item examines general influence of all messages of different types in certain newspaper on certain group.

### ***Certain message type / all mass media***

This item examines influence of all messages of certain type in all mass media on certain group.

***Certain message type / certain newspaper***

This item examines general influence of all messages of certain types in certain newspaper on certain group.

***Mass media request***

This submenu deals with the inquiries about all groups. The following types of inquiries are possible.

- All message types / all mass media
- All message types / certain newspaper
- Certain message type / all mass media
- Certain message type / certain newspaper

***All message types / all mass media***

This item examines general influence of all messages of different types in all mass media on all groups.

***All message types / certain newspaper***

This item examines general influence of all messages of different types in certain newspaper on all groups.

***Certain message type / all mass media***

This item examines influence of all messages of certain type in all mass media on certain all groups.

***Certain message type / certain newspaper***

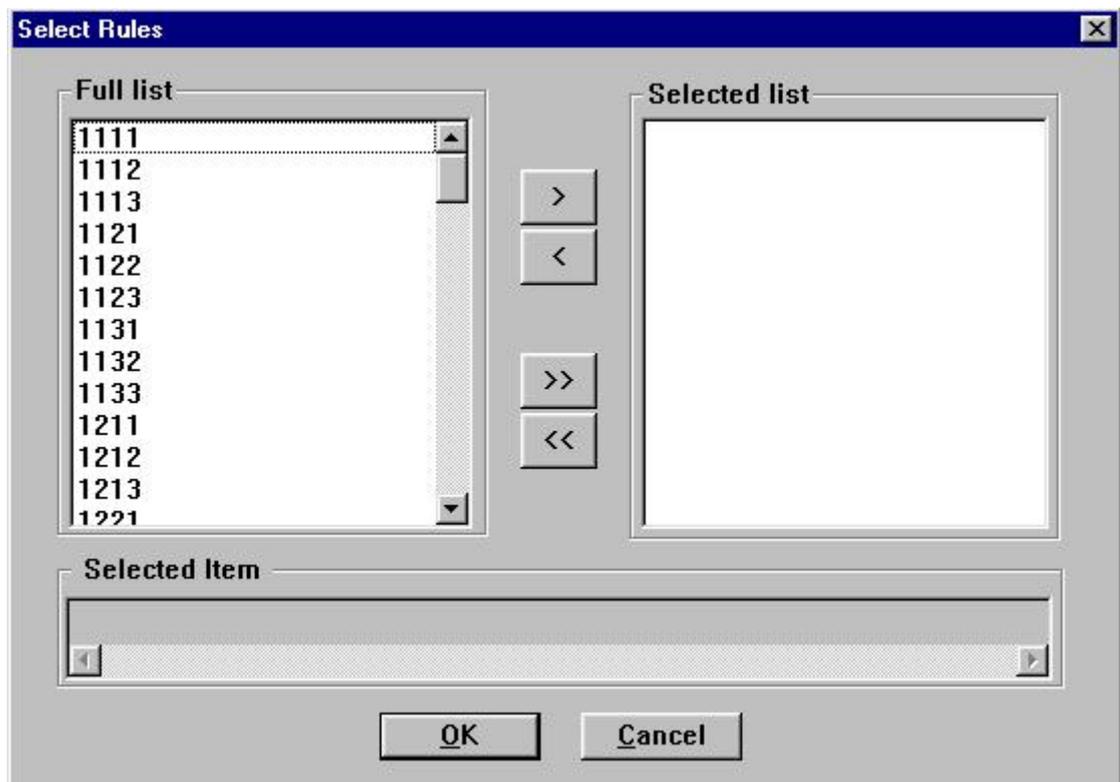
This item examines general influence of all messages of certain types in certain newspaper on all groups.

***Recommendation***

This item examines general influence of all messages of different types in all mass media on certain group and recommends how to increase positive influence.

***Explanation***

This procedure allows getting verbal explanation for causes that lead to certain group opinion. The premises for the inference can be selected from a multi-dimensional list.



### ***Diagrams***

Building graphical representation of response data.

The horizontal axis represents individual factors of messages; the vertical ones represent B-coefficients.  $\beta$ -coefficient shows relative weight of this factor in a group response.

For factor descriptions see topic Factors.

### ***Chapter conclusions***

Thus, the knowledge based expert system can perform the following operations with database tables: querying a database; getting explanation; making inferences basing on the rules and facts; making recommendations, etc.

This version of the expert system runs under Windows'98. The system is implemented using Visual Prolog 5.2.

The expert system EXPERT was tested on the incomplete data. Further data acquisition is planned for the future. In further development, it is possible to add additional system blocks, e.g. content-analysis block, correlation and regression analysis blocks.

## SUMMARY

*Thus, in the course of this research the following main results were obtained.*

A number of social and demographic factors have been determined influencing the attitude of Ukrainian population towards NATO. Based on the factors found, fifty-four different groups (substrata) were distinguished in Ukrainian population according to the specifics of their reaction to informational influence regarding NATO.

A technique was developed for quantitative content-analysis of video, audio and textual informational messages in Ukrainian mass media.

Informational domain monitoring and content-analysis of all messages concerning the image and activity of the Alliance were carried out. Such content-analysis was performed for a set of newspapers covering the basic parts of Ukrainian political spectrum (for the period of 1996-2001), and for all messages of the most popular TV channels: UT-1, UT-2, Inter and the central Ukrainian radio channel (during the period of research).

Sociological expert analysis was done for the correlation characteristics between NATO related informational flows in Ukrainian mass media and the dynamics of the attitude to the Alliance in every population group distinguished.

Cognitive analysis of the attitude to NATO dynamics was done for all basic strata of Ukrainian population and recommendation were prepared as to the technique for effective informational management of the population strata.

A statistical model was grounded and developed for quantitative dependencies between information influence on population strata and the dynamics of their mental orientation.

Qualitative and quantitative analysis of information presentation specifics was done for the most important Ukrainian mass media including TV, radio and press; approximation models of mass media dynamics reconstruction were developed basing on the correlation characteristics found.

Approximate regression analysis of printed mass media influence on attitude to NATO dynamics in different population groups was performed.

An analysis of political and social aspects of cooperation between Ukraine and NATO was performed.

A knowledge-based expert system was developed and implemented in Visual-Prolog. It is a kind of decision support system for optimal planning of informational management of the dynamics of public opinion about NATO. The expert system allows calculating quantitative characteristics of information influence of mass media and determine the population groups that are the most perspective in regard of the informational management.

The results received allowed to develop qualitative recommendations for planning information management of the attitude towards the European integration process (including NATO) in the strata of Ukrainian population. The recommendations were proposed to the Office for Public Relation of the Administration of the President of Ukraine, to the Parliament Committee on Liberty of Speech and Information, to the editorial boards of the most popular mass media and to political leaders for practical usage.

The directions were proposed for future improvement of logical and mathematical models of

informational management of dynamics of Ukrainian population strata mentality regarding NATO. The improvement of the models as well as the further development of the expert decision support system will be continued in PhD research of Anna Zavolodko, a post-graduate student of National Technical University “Kharkov Polytechnic Institute” (NTU “KhPI”, Information Systems Department, having participated in the project). The improvement will be based mainly on search for certain indices of information block representation that are going to be optimised according to the correlation analysis method applied to mentality dynamics in population groups.

Some specific issues concerning the research will be covered in the degree theses of the students of the NTU “KhPI”.

Several scientific papers will be published describing main results of the project.

### **ACKNOWLEDGMENTS**

The Fellow is grateful to the members of Selection Committee and to NATO Secretary General Lord George Robertson personally for the great honour of being awarded prestigious Manfred Worner Fellowship.

The Fellow is grateful to Ms. Anna Verscheure-Langenberg, Mr. Jose Maria Lopez-Navarro from Academic Affairs Office and Ms. Monique Tuffelli-Pierre, the head of Outreach and Partner Relation Section for the fruitful discussion of our work and helpful advises.

The Fellow and his team hope that the results of this research will be useful for their colleagues at NATO Office of Information and Documentation in Ukraine (Kiev). We are very thankful to Ms. Natalie Melnichuk, Mr. John Karwatsky and many other people from the Office for their kind attention to our work and informational support during the project implementation.

**SOME NEW INFORMATION POLITIC RECOMMENDATIONS  
(TO WHOM IT MAY CONCERN)**

1. To develop positive attitude towards NATO among the population of Ukraine, the development of *qualitatively new information policy model is necessary*. The model should be based *on the idea that integration to Europe, which is desirable for most Ukrainian citizens, is possible only through integration to all basic European structures – the Council of Europe, the European Community as well as NATO*. In this context, *the Alliance is viewed not as an independent purpose, but as a means to achieve a more significant (unconditional) aim of integration to Europe*. In this case, positive dynamics of Ukrainians' attitude towards NATO greatly depends on the media stance concerning the European orientation as a whole, whether they associate European integration with the accomplishment of the goals of the above mentioned social strata constituting the absolute majority of Ukrainian population.

1. To provide efficient information policy and develop positive NATO image in social consciousness, *we recommend media managers to give more information concerning all practical actions within NATO-Ukraine cooperation in military and civil spheres and take into account the specific reactions of certain social groups discovered in the course of our research*.

2. It is necessary to collaborate with people and organizations engaged in educational work among the population:

- a) to support friendly non-state organizations (inviting specialists, arranging seminars, etc.);
- b) to work with history teachers from secondary schools (organizing round-table conferences with participation of the NATO Information and Documentation Centre representatives, publishing teacher's manuals, providing the teachers with informational literature from the Centre); this aspect of work is rather important, because school pupils are practically the only group of the population that has not experienced zombieing influence of Soviet propagandistic machine; it is clear that a task of developing certain image is far easier than a task of replacing one image with another;
- c) to work with young political science teachers from higher educational institutions (seminars, international conferences, lectures of professors from leading European and American universities concerning international relations issues including international terrorism).
- d) to work with the media representatives: it is necessary to organize round-table conferences, seminars etc. *for central as well as regional press journalists*, the role of the latter is increased due to the financial crisis when people often limit the quantity of the press purchased.

3. Some time ago such magazines as «America» and «England» played significant role in destruction of Soviet system of totalitarian ideological values. Such magazine and similar TV series (e.g., “**Window to Europe**”, like “Window to America” – a well-known TV series in Ukraine) about the life and activity of the EU would be necessary informing as well about the activity of NATO as a common European defence structure. *Special attention should be paid to propaganda of human rights and explanation of their connection with economic and political achievements of NATO member countries*, which would be prospective for the desirable changes in the mentality of the main strata of Ukrainian population. The magazine and should be aimed at intellectuals. Taking into account low purchasing capacity of this social group in modern Ukraine, the magazine should be freely distributed among libraries, universities and public organizations.

## PPENDIXES

**Appendix 1. Encoded groups given in decreasing order of  
their size**

<b>Code of groups</b>	<b>The apportioned size of groups in the whole population of Ukraine (in %)</b>	<b>Group size *</b>
1113	8.12	3979571
1112	4.73	2319382
2132	4.73	2319382
2133	4.63	2270553
2113	4.33	2124066
1132	4.09	2001993
3132	3.79	1855506
3133	3.54	1733433
1123	3.39	1660189
2131	3.39	1660189
1122	3.29	1611360
1133	3.04	1489287
1111	2.89	1416044
2112	2.79	1367215
1131	2.49	1220727
2122	2.44	1196313
2123	2.44	1196313
3131	2.39	1171898
1121	2.04	1000997
2232	1.74	854509
3233	1.69	830095
2111	1.64	805680
2233	1.59	781266
3232	1.59	781266
2121	1.25	610364
1233	1.00	488291
1213	0.95	463876
3122	0.95	463876

---

\* Given figures reflect the approximate size of groups on the moment when the interrogation was conducted.

<b>Code of groups</b>	<b>The apportioned size of groups in the whole population of Ukraine (in %)</b>	<b>Group size*</b>
3123	0.95	463876
1232	0.90	439462
2231	0.90	439462
3231	0.90	439462
3222	0.85	415047
2213	0.75	366218
2222	0.75	366218
2223	0.75	366218
3121	0.75	366218
3223	0.65	317389
3113	0.60	292975
1231	0.55	268560
3221	0.50	244145
1223	0.45	219731
2212	0.45	219731
2221	0.35	170902
3112	0.35	170902
1211	0.30	146487
1212	0.30	146487
3111	0.30	146487
1221	0.20	97658
1222	0.20	97658
3213	0.20	97658
2211	0.15	73244
3212	0.10	48829
3211	0.05	24415

---

\* Given figures reflect the approximate size of groups on the moment when the interrogation was conducted.











































**9. Content-analysis of Den**

№ of message	Date	Size	Announcement	Visual effects	ORIENTATION OF THE MESSAGE				General attitude towards NATO			Anchor-constructs						Groups of reference					Russia	
					Information	Analysis	Opinion of an amateur	Call	Positive	Neutral	Negative	Defence	Aggression	Dependency	Autonomy	Prosperity	Poverty	President	Parliament	Government and Bureaucracy	NGO's	Political parties		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1	20.03.1997	22.8			+					+														
2	25.03.1997	174.2			+					+														+
3	27.03.1997	102.0			+					+												+		
4	27.03.1997	11.3			+					+														
5	28.03.1997	266.5		+		+				+									+					+
6	05.03.1998	50.4		+		+			+											+				
7	07.03.1998	17.2			+					+														
8	10.03.1998	17.4			+					+														
9	10.03.1998	110.5		+			+			+														+
10	12.03.1998	8.8			+					+														
11	12.03.1998	32.8		+			+			+														+
12	21.03.1998	101.9			+					+												+		+
13	26.03.1998	33.6					+			+														+
14	28.03.1998	180.6			+				+											+				+
15	28.03.1998	62.4			+					+														
16	07.04.1998	12.8					+			+														
17	15.04.1998	35.7		+			+		+											+				
18	23.04.1998	69.7		+			+			+														
19	12.05.1998	58.8		+		+			+											+				
20	13.05.1998	39.6					+			+														
21	16.05.1998	108.8			+					+														+
22	20.05.1998	43.0		+			+			+														+
23	26.05.1998	24.8		+			+				+													+
24	27.05.1998	15.1		+			+		+															
25	27.05.1998	23.7					+				+													+
26	30.05.1998	39.9			+					+														
27	30.05.1998	24.0					+			+														+
28	01.08.1998	20.8		+	+					+														
29	12.08.1998	10.8		+	+					+														
30	19.08.1998	116.1					+		+								+							
31	26.08.1998	15.1		+			+			+														
32	03.09.1998	28.4			+					+														
33	05.09.1998	46.2		+			+			+														
34	08.09.1998	27.5			+					+														
35	10.09.1998	17.2			+					+														
36	12.09.1998	31.0			+					+														
37	15.09.1998	4.0			+					+														
38	15.09.1998	10.0		+	+					+														
39	29.09.1998	41.2		+			+			+														
40	30.09.1998	18.9			+						+													+
41	30.09.1998	13.2		+	+					+														
42	01.10.1998	632.5		+		+				+												+		+











**10. Content-analysis of Nezavisimost**

№ of message	Date	Size	Announcement	Visual effects	ORIENTATION OF THE MESSAGE				General attitude towards NATO			Anchor-constructs						Groups of reference					
					Information	Analysis	Opinion of an amateur	Call	Positive	Neutral	Negative	Defence	Aggression	Dependency	Autonomy	Prosperity	Poverty	President	Parliament	Government and Bureaucracy	NGO's	Political parties	Russia
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	02.02.1996	24.8					+			+													
2	14.02.1996	38.3		+			+			+													
3	16.02.1996	68.0		+			+		+											+			
4	22.03.1996	39.0		+	+				+														+
5	26.03.1996	198.0		+			+			+													
6	05.04.1996	207.0		+			+		+			+											
7	19.04.1996	89.3		+			+			+													
8	26.04.1996	456.0		+			+			+													
9	26.04.1996	25.0		+			+			+													
10	30.04.1996	139.2					+			+													
11	07.03.1997	16.5			+					+													+
12	19.03.1997	358.8		+			+			+										+			+
13	21.03.1997	52.0			+				+														
14	25.03.1997	19.4			+					+													
15	25.03.1997	33.1			+				+														
16	25.03.1997	18.0		+	+					+													
17	26.03.1997	184.3			+					+													+
18	26.03.1997	30.2			+					+													
19	28.03.1997	19.4			+					+													
20	02.04.1997	69.6					+			+													
21	09.05.1997	155.2			+					+													
22	09.05.1997	20.5		+			+			+													
23	13.05.1997	7.2			+					+													
24	13.05.1997	223.2		+			+			+													+
25	13.05.1997	147.0					+				+								+				
26	13.05.1997	216.0		+			+			+													+
27	14.05.1997	14.0			+						+												
28	14.05.1997	44.4					+			+													+
29	14.05.1997	34.6			+					+													
30	14.05.1997	1116.0					+			+													+
31	21.05.1997	29.6			+					+													
32	21.05.1997	7.4					+			+													
33	23.05.1997	84.0		+			+			+										+			
34	27.05.1997	86.8		+					+											+			+
35	27.05.1997	144.0								+									+				
36	27.05.1997	35.0			+					+													+
37	27.05.1997	29.2				+				+										+			+
38	28.05.1997	74.9					+			+													
39	28.05.1997	31.4			+				+									+					
40	28.05.1997	90.0					+			+													+
41	28.05.1997	75.0		+			+			+													+
42	06.03.1998	26.9		+		+			+										+				+





1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
43	19.02.01	0.28	+					+			+											
44	19.02.01	0.83	+				+															
45	20.02.01	0.25	+						+													
46	20.02.01	0.5	+						+													
47	20.02.01	0.42	+						+													+
48	21.02.01	0.67	+						+													
49	21.02.01	0.58	+					+			+											
50	22.02.01	0.33	+					+			+											
51	22.02.01	0.92	+					+			+											
52	22.02.01	0.33	+						+													
53	25.02.01	0.67	+						+													
54	27.02.01	0.2	+				+															
55	27.02.01	3.5		+					+													
56	08.03.01	0.53	+						+		+											
57	09.03.01	0.53	+						+		+											
58	12.03.01	0.33	+						+		+											
59	12.03.01	0.25	+						+		+											
60	14.03.01	0.83	+				+			+												
61	14.03.01	0.5	+				+															
62	14.03.01	1.33	+					+														
63	14.03.01	0.83	+					+			+											
64	14.03.01	0.25	+				+			+												
65	14.03.01	0.75	+						+													
66	14.03.01	1.95	+				+															
67	22.03.01	0.25	+				+			+												
68	23.03.01	0.83	+				+			+												
69	03.04.01	0.5	+				+			+												
70	03.04.01	0.17	+					+														
71	04.04.01	0.75	+				+			+												
72	04.04.01	0.42	+				+															
73	04.05.01	1.28	+						+													
74	20.05.01	1.25	+				+															
75	20.05.01	0.92	+						+													
76	28.05.01	0.5	+						+													
77	29.05.01	1.58	+						+													
78	29.05.01	0.5	+						+													
79	30.05.01	0.67	+						+													
80	30.05.01	0.72	+				+															
81	30.05.01	1.35	+				+											+				
82	30.05.01	0.42	+						+													
83	30.05.01	0.42	+						+													
84	30.05.01	0.42	+				+			+									+			
85	31.05.01	0.33	+				+															
86	05.06.01	0.33	+						+													
87	06.06.01	1.25	+						+										+			
88	09.06.01	0.92	+				+							+				+				
89	16.06.01	0.25	+						+													
90	20.06.01	1.2	+						+													
91	05.07.01	0.5	+						+													+
92	05.07.01	0.42	+				+			+												
93	05.07.01	1.25			+			+							+							













## Appendix 6. Database tables

**DEF** table

The auxiliary table

```
def("v", "Ratio size", 1)
def("tir", "Circulation", 1)
def("ppn", "Amount of messages ", 1)
def("vis", "Illustrations", 1)
def("anal", "Analysis", 2)
def("inf", "Information", 2)
def("cal", "Call", 2)
def("opin", "Amateur opinion", 2)
def("pos", "Positive", 3)
def("neu", "Neutral", 3)
def("neg", "Negative", 3)
def("aut", "Autonomy", 4)
def("agr", "Aggression", 4)
def("def", "Defend", 4)
def("dep", "Dependency", 4)
def("rich", "Prosperity", 4)
def("pur", "Poverty", 4)
def("isp", "Bureaucracy", 5)
def("pres", "President", 5)
def("parl", "Parliament", 5)
def("ngo", "NGOs", 5)
def("part", "Political parties", 5)
def("russia", "Russia", 6)
def("attit", "General attitude", 6)
```

**GROUP** table

contains group number, 4-digit group code and group size

group (1,1,1,1,1,1416044)	group (28,2,2,1,1,73244)
group (2,1,1,1,2,2319382)	group (29,2,2,1,2,219731)
group (3,1,1,1,3,3979571)	group (30,2,2,1,3,366218)
group (4,1,1,2,1,1000997)	group (31,2,2,2,1,170902)
group (5,1,1,2,2,1611360)	group (32,2,2,2,2,366218)
group (6,1,1,2,3,1660189)	group (33,2,2,2,3,366218)
group (7,1,1,3,1,1220727)	group (34,2,2,3,1,439462)
group (8,1,1,3,2,2001993)	group (35,2,2,3,2,854509)
group (9,1,1,3,3,1489287)	group (36,2,2,3,3,781266)
group (10,1,2,1,1,146487)	group (37,3,1,1,1,146487)
group (11,1,2,1,2,146487)	group (38,3,1,1,2,170902)
group (12,1,2,1,3,463876)	group (39,3,1,1,3,292975)
group (13,1,2,2,1,97658)	group (40,3,1,2,1,366218)
group (14,1,2,2,2,97658)	group (41,3,1,2,2,463876)
group (15,1,2,2,3,219731)	group (42,3,1,2,3,463876)
group (16,1,2,3,1,268560)	group (43,3,1,3,1,1171898)
group (17,1,2,3,2,439462)	group (44,3,1,3,2,1855506)
group (18,1,2,3,3,488291)	group (45,3,1,3,3,1733433)
group (19,2,1,1,1,805680)	group (46,3,2,1,1,24415)
group (20,2,1,1,2,1367215)	group (47,3,2,1,2,48829)
group (21,2,1,1,3,2124066)	group (48,3,2,1,3,97658)
group (22,2,1,2,1,610364)	group (49,3,2,2,1,244145)
group (23,2,1,2,2,1196313)	group (50,3,2,2,2,415047)
group (24,2,1,2,3,1196313)	group (51,3,2,2,3,317389)
group (25,2,1,3,1,1660189)	group (52,3,2,3,1,439462)
group (26,2,1,3,2,2319382)	group (53,3,2,3,2,781266)
group (27,2,1,3,3,2270553)	group (54,3,2,3,3,830095)

**OPIN\_DYN** table

The auxiliary table

```
opin_dyn(1,-1122282,11231804).  
opin_dyn(2,1167073,11461043).  
opin_dyn(3,-4592989,12704020).  
opin_dyn(4,-5172411,9381256).  
opin_dyn(5,-5472480,8886694).  
opin_dyn(6,-5220574,13165095).
```

**ORIG** table

contains statistical data

orig(1,1996,13,4,16,8,8,6)	orig(28,1996,0,1,0,1,0,2)
orig(2,1996,26,10,24,14,12,16)	orig(29,1996,0,3,1,1,1,0)
orig(3,1996,31,16,40,31,15,17)	orig(30,1996,1,2,2,0,4,2)
orig(4,1996,9,3,8,7,4,5)	orig(31,1996,1,2,2,3,0,0)
orig(5,1996,18,6,15,13,17,2)	orig(32,1996,0,6,1,1,2,0)
orig(6,1996,26,11,12,12,9,4)	orig(33,1996,0,6,1,1,3,0)
orig(7,1996,17,4,14,11,3,5)	orig(34,1996,2,8,5,0,2,2)
orig(8,1996,32,9,24,15,6,9)	orig(35,1996,2,12,6,5,4,3)
orig(9,1996,19,9,22,18,17,5)	orig(36,1996,4,18,6,6,7,6)
orig(10,1996,0,0,2,0,0,0)	orig(37,1996,1,0,3,1,2,1)
orig(11,1996,1,0,4,0,0,0)	orig(38,1996,1,0,3,2,2,1)
orig(12,1996,1,0,5,0,0,1)	orig(39,1996,2,3,4,1,3,2)
orig(13,1996,0,0,0,0,0,1)	orig(40,1996,1,3,4,2,2,1)
orig(14,1996,0,0,3,0,0,1)	orig(41,1996,0,9,2,2,4,2)
orig(15,1996,0,2,3,0,0,0)	orig(42,1996,3,9,7,4,5,0)
orig(16,1996,4,2,1,0,1,1)	orig(43,1996,2,4,6,7,6,1)
orig(17,1996,3,1,3,4,1,2)	orig(44,1996,3,7,5,2,5,2)
orig(18,1996,3,7,3,1,2,2)	orig(45,1996,6,19,11,3,10,5)
orig(19,1996,10,5,12,4,2,5)	orig(46,1996,0,1,2,0,1,0)
orig(20,1996,9,11,12,12,19,6)	orig(47,1996,0,1,1,1,3,1)
orig(21,1996,4,17,16,11,17,11)	orig(48,1996,0,3,2,0,0,1)
orig(22,1996,4,3,7,3,5,2)	orig(49,1996,0,1,3,0,3,1)
orig(23,1996,8,9,12,6,8,3)	orig(50,1996,1,1,1,1,0,3)
orig(24,1996,1,9,16,6,4,4)	orig(51,1996,0,5,3,4,6,4)
orig(25,1996,8,6,11,6,7,9)	orig(52,1996,2,6,8,2,7,2)
orig(26,1996,13,15,24,22,10,6)	orig(53,1996,5,12,7,2,13,4)
orig(27,1996,8,22,28,11,21,11)	orig(54,1996,1,15,4,7,11,8)

orig(1,1997,5,1,16,7,2,4)	orig(28,1997,0,3,3,1,0,2)
orig(2,1997,19,4,20,9,10,6)	orig(29,1997,1,4,3,1,7,0)
orig(3,1997,11,11,19,5,8,3)	orig(30,1997,0,12,2,1,2,2)
orig(4,1997,9,3,15,12,6,4)	orig(31,1997,0,0,3,2,0,2)
orig(5,1997,18,6,21,27,11,14)	orig(32,1997,0,1,2,1,1,6)
orig(6,1997,31,16,41,33,10,11)	orig(33,1997,3,3,4,2,2,4)
orig(7,1997,31,5,14,20,5,11)	orig(34,1997,2,6,5,2,3,1)
orig(8,1997,32,5,25,20,11,11)	orig(35,1997,3,8,12,6,10,5)
orig(9,1997,31,10,19,11,9,7)	orig(36,1997,1,18,5,1,6,4)
orig(10,1997,0,1,0,0,0,0)	orig(37,1997,1,3,7,1,3,1)
orig(11,1997,2,2,0,0,2,1)	orig(38,1997,4,3,7,2,5,2)
orig(12,1997,1,2,1,1,0,0)	orig(39,1997,2,7,7,2,5,4)
orig(13,1997,2,1,0,0,1,0)	orig(40,1997,2,1,7,1,4,4)
orig(14,1997,0,1,4,1,1,0)	orig(41,1997,0,6,9,2,3,1)
orig(15,1997,0,1,2,0,3,1)	orig(42,1997,3,7,12,1,6,6)
orig(16,1997,2,1,2,0,2,3)	orig(43,1997,3,5,7,4,7,2)
orig(17,1997,2,1,6,4,4,3)	orig(44,1997,4,12,19,9,11,3)
orig(18,1997,1,6,3,1,5,4)	orig(45,1997,7,14,14,1,17,5)
orig(19,1997,4,1,3,2,4,2)	orig(46,1997,0,2,4,1,0,0)
orig(20,1997,8,10,4,3,6,3)	orig(47,1997,1,3,4,4,6,2)
orig(21,1997,1,10,4,3,1,1)	orig(48,1997,0,4,4,1,3,0)
orig(22,1997,2,2,11,7,4,2)	orig(49,1997,1,0,0,0,3,1)
orig(23,1997,7,8,10,8,6,9)	orig(50,1997,0,4,0,1,2,0)
orig(24,1997,6,14,28,7,14,7)	orig(51,1997,0,6,1,0,3,1)
orig(25,1997,6,1,20,7,11,3)	orig(52,1997,6,6,11,7,4,4)
orig(26,1997,10,11,36,10,17,4)	orig(53,1997,4,12,14,5,11,5)
orig(27,1997,6,17,25,10,15,2)	orig(54,1997,2,19,10,1,8,3)

orig(1,1998,3,3,26,12,8,4)	orig(28,1998,0,2,1,0,0,0)
orig(2,1998,20,4,28,33,8,5)	orig(29,1998,0,1,3,0,1,0)
orig(3,1998,23,13,53,22,21,14)	orig(30,1998,0,6,2,0,4,2)
orig(4,1998,9,3,10,10,2,3)	orig(31,1998,0,1,3,0,2,0)
orig(5,1998,8,6,14,13,15,2)	orig(32,1998,2,4,5,1,3,2)
orig(6,1998,11,8,22,10,5,4)	orig(33,1998,0,6,2,0,5,0)
orig(7,1998,9,3,17,14,8,8)	orig(34,1998,1,11,8,4,3,3)
orig(8,1998,19,5,32,25,7,8)	orig(35,1998,3,17,7,4,8,12)
orig(9,1998,9,14,19,9,11,9)	orig(36,1998,1,19,6,5,8,10)
orig(10,1998,2,0,0,2,0,0)	orig(37,1998,0,1,2,3,1,1)
orig(11,1998,1,2,1,2,0,0)	orig(38,1998,0,4,1,2,5,0)
orig(12,1998,0,0,1,1,3,1)	orig(39,1998,0,6,5,3,4,0)
orig(13,1998,0,0,2,0,0,1)	orig(40,1998,1,2,5,5,2,1)
orig(14,1998,0,0,3,1,1,1)	orig(41,1998,0,4,4,4,8,3)
orig(15,1998,1,4,0,0,0,0)	orig(42,1998,0,5,3,1,9,0)
orig(16,1998,1,1,3,0,0,0)	orig(43,1998,6,7,8,3,4,1)
orig(17,1998,3,0,3,3,3,3)	orig(44,1998,6,13,14,7,4,2)
orig(18,1998,1,15,8,3,2,2)	orig(45,1998,3,19,6,3,3,2)
orig(19,1998,3,5,8,3,8,4)	orig(46,1998,0,1,2,0,2,0)
orig(20,1998,6,8,11,7,11,5)	orig(47,1998,0,1,3,0,0,2)
orig(21,1998,2,21,24,4,12,9)	orig(48,1998,0,2,5,1,6,2)
orig(22,1998,4,8,8,0,6,0)	orig(49,1998,1,4,1,1,1,0)
orig(23,1998,3,15,8,2,4,5)	orig(50,1998,1,3,5,0,3,1)
orig(24,1998,3,16,12,3,13,2)	orig(51,1998,0,6,6,1,2,2)
orig(25,1998,6,6,16,8,7,11)	orig(52,1998,6,7,7,3,2,0)
orig(26,1998,4,13,24,7,20,15)	orig(53,1998,4,14,4,4,14,1)
orig(27,1998,7,26,13,8,17,9)	orig(54,1998,2,14,13,0,11,3)

orig(1,1999,4,5,8,3,8,1)	orig(28,1999,0,0,2,0,0,1)
orig(2,1999,11,7,10,11,8,3)	orig(29,1999,3,2,2,1,0,1)
orig(3,1999,8,4,9,6,10,5)	orig(30,1999,0,5,3,1,1,2)
orig(4,1999,7,9,22,7,15,5)	orig(31,1999,1,1,3,0,1,0)
orig(5,1999,6,19,41,14,20,3)	orig(32,1999,1,0,3,2,4,2)
orig(6,1999,20,23,50,17,35,9)	orig(33,1999,1,13,2,1,1,0)
orig(7,1999,12,14,23,14,14,5)	orig(34,1999,2,10,5,1,2,2)
orig(8,1999,19,25,27,17,21,4)	orig(35,1999,1,16,8,2,8,2)
orig(9,1999,23,25,25,7,12,7)	orig(36,1999,2,12,2,0,6,4)
orig(10,1999,0,1,2,1,1,0)	orig(37,1999,0,3,0,1,1,0)
orig(11,1999,1,0,2,0,1,0)	orig(38,1999,0,5,5,1,6,2)
orig(12,1999,0,1,0,3,1,0)	orig(39,1999,2,2,1,1,8,1)
orig(13,1999,0,0,1,0,0,0)	orig(40,1999,0,1,0,2,2,1)
orig(14,1999,1,0,1,1,1,0)	orig(41,1999,0,2,1,0,1,1)
orig(15,1999,1,3,2,0,1,4)	orig(42,1999,0,7,1,1,2,1)
orig(16,1999,1,2,1,2,2,0)	orig(43,1999,8,16,14,4,6,2)
orig(17,1999,2,2,5,0,1,1)	orig(44,1999,2,24,10,4,12,4)
orig(18,1999,0,3,1,0,2,0)	orig(45,1999,2,17,8,2,16,8)
orig(19,1999,1,4,8,1,4,3)	orig(46,1999,0,1,0,0,2,0)
orig(20,1999,3,6,11,2,3,4)	orig(47,1999,0,5,0,1,2,0)
orig(21,1999,0,12,6,1,5,3)	orig(48,1999,0,6,1,1,4,4)
orig(22,1999,3,6,12,2,5,1)	orig(49,1999,0,3,0,0,0,0)
orig(23,1999,4,11,22,3,7,2)	orig(50,1999,0,5,0,0,2,2)
orig(24,1999,3,30,16,11,14,9)	orig(51,1999,0,9,1,1,3,1)
orig(25,1999,3,14,20,9,19,3)	orig(52,1999,1,7,2,1,7,1)
orig(26,1999,5,24,37,9,28,12)	orig(53,1999,1,20,5,2,10,6)
orig(27,1999,9,51,23,8,16,12)	orig(54,1999,1,21,5,1,8,3)

orig(1,2000,10,2,9,8,7,2)	orig(28,2000,1,2,0,1,2,1)
orig(2,2000,9,9,19,10,6,10)	orig(29,2000,1,6,3,2,1,2)
orig(3,2000,10,12,19,10,9,6)	orig(30,2000,0,5,3,3,1,2)
orig(4,2000,5,5,21,13,10,3)	orig(31,2000,0,0,0,1,1,1)
orig(5,2000,15,4,19,17,16,20)	orig(32,2000,1,3,2,1,1,1)
orig(6,2000,28,28,46,19,25,16)	orig(33,2000,0,4,5,3,2,1)
orig(7,2000,8,5,15,11,3,7)	orig(34,2000,0,7,2,1,6,2)
orig(8,2000,13,7,26,10,17,8)	orig(35,2000,2,15,7,1,8,2)
orig(9,2000,10,14,10,12,10,5)	orig(36,2000,0,17,3,2,8,2)
orig(10,2000,1,1,1,1,0,0)	orig(37,2000,1,2,3,4,3,2)
orig(11,2000,0,1,2,0,0,0)	orig(38,2000,1,5,3,2,6,2)
orig(12,2000,1,2,0,1,5,0)	orig(39,2000,1,7,4,0,5,2)
orig(13,2000,0,2,1,1,1,1)	orig(40,2000,0,1,2,0,2,1)
orig(14,2000,1,3,1,0,1,0)	orig(41,2000,0,1,5,0,1,0)
orig(15,2000,0,3,5,0,6,4)	orig(42,2000,0,1,6,1,2,2)
orig(16,2000,1,2,3,0,4,0)	orig(43,2000,4,6,12,8,12,5)
orig(17,2000,0,11,2,3,1,1)	orig(44,2000,7,16,22,8,13,8)
orig(18,2000,0,10,4,0,4,2)	orig(45,2000,4,30,13,2,15,5)
orig(19,2000,3,3,7,7,4,1)	orig(46,2000,0,1,5,1,1,2)
orig(20,2000,4,9,15,6,12,3)	orig(47,2000,0,5,9,1,1,1)
orig(21,2000,2,18,13,4,10,2)	orig(48,2000,0,4,3,0,4,1)
orig(22,2000,3,4,12,4,7,2)	orig(49,2000,0,0,1,0,0,0)
orig(23,2000,0,12,15,6,16,5)	orig(50,2000,0,0,0,0,1,0)
orig(24,2000,5,27,22,8,19,4)	orig(51,2000,0,1,2,1,0,0)
orig(25,2000,4,13,23,7,15,6)	orig(52,2000,1,4,9,0,2,2)
orig(26,2000,2,31,30,8,16,8)	orig(53,2000,2,10,8,3,7,2)
orig(27,2000,5,31,28,9,15,5)	orig(54,2000,1,9,17,3,1,3)

orig(1,2001,4,1,12,6,7,2)	orig(28,2001,0,3,2,1,1,0)
orig(2,2001,14,3,18,12,6,1)	orig(29,2001,0,5,2,1,3,2)
orig(3,2001,7,10,17,10,12,5)	orig(30,2001,2,4,2,1,1,2)
orig(4,2001,12,3,21,8,6,7)	orig(31,2001,0,3,3,0,1,0)
orig(5,2001,15,10,31,16,15,8)	orig(32,2001,0,2,4,1,3,1)
orig(6,2001,29,18,60,20,25,6)	orig(33,2001,0,6,5,1,4,2)
orig(7,2001,9,5,23,9,9,6)	orig(34,2001,0,2,5,0,6,3)
orig(8,2001,16,10,34,11,20,6)	orig(35,2001,1,6,9,3,5,1)
orig(9,2001,16,24,27,11,13,7)	orig(36,2001,0,13,7,3,6,2)
orig(10,2001,0,0,1,0,1,0)	orig(37,2001,0,3,6,3,0,3)
orig(11,2001,4,0,2,0,2,1)	orig(38,2001,0,11,6,3,6,3)
orig(12,2001,0,2,1,0,1,1)	orig(39,2001,1,12,7,2,9,5)
orig(14,2001,1,0,2,0,1,0)	orig(40,2001,0,1,3,2,2,0)
orig(15,2001,1,1,1,2,1,0)	orig(41,2001,1,2,4,0,3,0)
orig(16,2001,0,0,4,1,2,1)	orig(42,2001,1,2,3,2,5,3)
orig(17,2001,1,3,4,0,4,0)	orig(43,2001,1,8,8,5,3,0)
orig(18,2001,0,3,4,3,3,0)	orig(44,2001,2,12,2,4,8,2)
orig(19,2001,1,4,11,3,6,3)	orig(45,2001,0,22,4,3,9,8)
orig(20,2001,2,4,20,4,12,0)	orig(46,2001,1,5,5,1,2,3)
orig(21,2001,3,14,14,5,7,4)	orig(47,2001,0,5,4,1,5,3)
orig(22,2001,2,4,10,3,4,4)	orig(48,2001,1,10,3,1,4,2)
orig(23,2001,2,7,13,8,11,4)	orig(49,2001,0,1,2,0,0,0)
orig(24,2001,1,21,25,9,20,10)	orig(50,2001,0,2,3,1,2,0)
orig(25,2001,6,5,21,16,8,2)	orig(51,2001,0,5,3,1,2,2)
orig(26,2001,13,26,24,11,19,11)	orig(52,2001,1,4,5,4,1,3)
orig(27,2001,10,13,29,7,12,9)	orig(53,2001,0,17,10,4,5,6)
	orig(54,2001,0,14,5,0,4,2)

**PART\_DEF** table

is the auxiliary table

```
part_def(1,"Quantitative variables").
part_def(2,"Message type").
part_def(3,"Attitude towards NATO").
part_def(4,"Anchor-constructs").
part_def(5,"References").
part_def(6,"Russia category").
```

**READ\_ALL** table

Relative values

```
read_all(1,0.145,0,0,0.036,0.018,0.127,0,0)
read_all(2,0.128,0,0,0.023,0.012,0.163,0.047,0)
read_all(3,0.216,0,0,0.014,0.014,0.162,0.014,0)
read_all(4,0.088,0.018,0.018,0.018,0.018,0.211,0,0)
read_all(5,0.22,0,0.012,0.012,0.024,0.171,0.012,0)
read_all(6,0.294,0.012,0.024,0.035,0.059,0.247,0.024,0)
read_all(7,0.18,0,0.016,0.049,0.033,0.18,0,0.016)
read_all(8,0.218,0,0.03,0.02,0.02,0.109,0.01,0)
read_all(9,0.226,0.013,0.026,0,0.032,0.123,0,0.006)
read_all(10,0,0,0,0,0,0,0,0)
read_all(11,0.1,0,0,0,0,0,0.1,0)
read_all(12,0.2,0,0,0,0,0.2,0,0)
read_all(13,0.25,0,0,0,0,0,0,0)
read_all(14,0,0,0,0,0,0.143,0,0)
read_all(15,0.25,0,0.125,0,0,0.25,0,0)
read_all(16,0,0,0,0,0,0,0,0)
read_all(17,0,0,0,0,0,0,0,0)
read_all(18,0,0,0,0,0.071,0,0,0)
read_all(19,0.075,0,0,0.038,0.019,0.057,0,0)
read_all(20,0.103,0.015,0,0,0,0.088,0,0)
read_all(21,0.132,0,0,0.057,0,0.094,0,0)
read_all(22,0.094,0,0,0.057,0.019,0.057,0,0)
read_all(23,0.06,0.012,0,0.072,0,0.072,0.024,0)
read_all(24,0.11,0,0.041,0.027,0.027,0.068,0,0)
read_all(25,0.135,0,0.054,0,0,0.081,0,0)
read_all(26,0.125,0.021,0.146,0.021,0.021,0.021,0,0)
read_all(27,0.133,0.011,0.078,0,0.011,0.022,0,0)
```

read\_all(28,0.182,0,0,0.091,0,0.091,0,0)  
read\_all(29,0.067,0,0,0.067,0.033,0.133,0.033,0)  
read\_all(30,0.175,0.025,0,0,0,0.075,0.05,0)  
read\_all(31,0.1,0,0,0.1,0,0,0,0)  
read\_all(32,0.174,0,0,0.043,0,0.087,0,0)  
read\_all(33,0.13,0,0,0,0,0.174,0,0)  
read\_all(34,0.2,0,0.2,0,0,0,0,0)  
read\_all(35,0.071,0,0,0,0,0.071,0,0.071)  
read\_all(36,0.095,0,0,0,0.048,0.048,0,0)  
read\_all(37,0.077,0,0,0.077,0,0.077,0,0)  
read\_all(38,0.118,0,0,0.059,0,0.059,0,0)  
read\_all(39,0.133,0.067,0.067,0,0,0.067,0,0)  
read\_all(40,0.071,0,0,0.095,0,0,0,0)  
read\_all(41,0.109,0,0,0.047,0,0.047,0,0)  
read\_all(42,0.176,0,0,0.059,0.02,0.078,0,0)  
read\_all(43,0,0,0,0,0,0,0,0)  
read\_all(44,0,0,0,0,0,0,0,0)  
read\_all(45,0.118,0.059,0,0,0,0.059,0,0)  
read\_all(46,0.154,0,0,0.077,0,0.077,0,0)  
read\_all(47,0.105,0,0,0,0,0.053,0,0)  
read\_all(48,0.154,0.077,0,0,0,0,0,0)  
read\_all(49,0.063,0,0,0.125,0.063,0,0,0)  
read\_all(50,0.1,0,0,0.067,0,0,0,0)  
read\_all(51,0.125,0,0,0,0,0,0,0)  
read\_all(52,0,0,0,0,0,0,0,0)  
read\_all(53,0,0,0,0,0,0,0,0)  
read\_all(54,0,0,0,0,0,0,0,0)

**READ\_IZDAN** table

newspapers number of readers

read\_izdan("Regional mass media",6027389.962)

read\_izdan("Communist",304425.019)

read\_izdan("Sel'skie vesti",984931.731)

read\_izdan("Argumenty i fakty",928729.354)

read\_izdan("Golos Ukraini",628625.741)

read\_izdan("Facti i commentarii",4146346.92)

read\_izdan("Segodnya",312847.969)

read\_izdan("Den'",89137.493)

read\_izdan("",0)

**SMI** table

contains newspaper names

smi("Regional mass media")

smi("Communist")

smi("Sel'skie vesti")

smi("Argumenty i fakty")

smi("Golos Ukraini")

smi("Facti i commentarii")

smi("Segodnya")

smi("Den'")

smi("Vecherhiy Khar'kov")

**SPRAV** table

the auxiliary table

```
sprav(1,1,"pro-Ukrainian")  
sprav(1,2,"centrist")  
sprav(1,3,"pro-Russian")  
sprav(2,1,"ukrainian")  
sprav(2,2,"russian")  
sprav(3,1,"village")  
sprav(3,2,"town")  
sprav(3,3,"city")  
sprav(4,1,"Age 18-29")  
sprav(4,2,"Age 30-49")  
sprav(4,3,"Age older than 50")
```

**TO** table

contains the results of regression analysis

```

to("To",40,0.878,"opin","Regional mass media")
to("To",42,0.841,"tir","Regional mass media")
to("To",43,0.907,"opin","Regional mass media")
to("To",45,0.906,"neu","Regional mass media")
to("From",37,-0.947,"neu","Regional mass media")
to("From",42,-0.91,"v","Regional mass media")
to("From",44,0.893,"russia","Regional mass media")
to("From",52,0.83,"vis","Regional mass media")
to("From",54,0.415,"v","Regional mass media")
to("From",54,-0.731,"opin","Regional mass media")
to("To",26,-0.876,"agr","Golos Ukraini")
to("To",29,0.869,"rich","Golos Ukraini")
to("To",30,0.941,"neu","Golos Ukraini")
to("To",31,-0.802,"rich","Golos Ukraini")
to("To",33,-0.897,"vis","Golos Ukraini")
to("To",34,0.817,"tir","Golos Ukraini")
to("To",40,-0.762,"agr","Golos Ukraini")
to("To",40,-0.787,"neg","Golos Ukraini")
to("To",42,0.846,"def","Golos Ukraini")
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**PRAV** - rulebase table

Contains rules for inference

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influence"])
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influence"])
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members"])
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members"])
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country independence "])  
prav(["nationality - Ukrainians"],["NATO is a guarantee against losing  
the Ukraine independence from Russia "])  
prav(["nationality - Ukrainians"],["NATO is the condition for  
obtaining western help"])  
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orientation"])  
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society"])  
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Western countries"])  
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independence"],["positive attitude to NATO"])  
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from Russia"],["positive attitude to NATO"])  
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attitude to NATO"])

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to NATO"])  
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aggressor, danger"],["negative attitude to NATO"])  
prav(["low receptivity to the media of another  
orientation"],["negative attitude to NATO"])  
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main reason of decrease in living standards"],["negative attitude  
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prav(["receptivity to mass media influence"],["it is possible to form  
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prav(["more chances for self-actualization in the Western  
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prav(["pro-Ukrainian region"],["highly developed national identity"])  
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prav(["the group had positive attitude dynamic in 1998"],["the cause  
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prav(["the group had negative attitude dynamic in 1999 "],["the cause  
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