

A NEW APPROACH ON THE PROCESSING OF QUESTIONNAIRES BASED ON THE PRINCIPLES OF SEMIOMETRY

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Abstract

This paper displays a new processing technique for the market research questionnaires using a method of combined analysis, which is based on the principles of Semiometry. Based upon the triple version of each word "feeling, importance and direction", a geographic dictionary is created, in which the words are not placed in alphabetical order but each one of them is positioned in relation to the other words according to the emerged feeling of the person under question.

A researcher who is willing to realize a market research using this new technique does not aim at obtaining opinions derived from questionnaires that are presented in a form of a sentence, which can more or less direct the asked person to specific responses, but intends to attribute values in certain words relatively to the pleasant or undesirable feeling evoked by their appeal, so as to finally emerge the basic structure of the psychograph of the social group the research is referred to.

With the elaboration of the aforementioned words using the Principal Component Analysis, and in combination with the social-professional variables, which are considered as supplementary variables, the researcher is given the chance to observe the emotional world of the social set that is of his interest, so as to evaluate qualitatively the subject under investigation using data analysis methods.

Key words : *Semiometry, Principal Components Analysis, Market research*

Introduction

The aim of Semiometry is to specify the special sensitivity of the persons questioned, by provoking their positive or negative reactions to certain words, which cause intense sentiments. This approach presupposes that each word contains an emotional load causing particular, yet different reactions to each one. This reactions' analysis results in the emergence of moral values connected for instance to the consumption of a product or the image of a car brand, the reading of the title of a book, the listening of a radio program. The described words' analysis above, is fulfilled through statistical methods of Data Analysis, in order to enable the researcher to express reliable results.

The standard method of Semiometry is based on a total of 210 words, representative of the western culture, the roots of which are found at 95% in the Old Testament. These words aim at describing the values and the way of living of the western civilization within the framework of psycho- sociological applications.

The Semiometric questionnaire does not intend to obtain aspects which derive from questions presented in the form of sentences, rather to attribute value to certain words according to the pleasant or unpleasant feeling of their invocation, so as to raise the basic semiometric structure of the social group it refers to.

The semiometric questionnaire is formed as follows: a scale of seven (7) ratings is associated to each word, from minus three (-3) up to plus three (+3), whereas (-) refers to possible unpleasant feelings the word evokes and (+) refers to pleasant sentiments. For the Data Processing this scale is substituted with an equivalent scale, marked from 1 to 7, where the -3 of the initial scale obviously corresponds to the quotation 1 of the new scale and the +3 of the initial scale corresponds to the 7 of the new scale.

The answers are initially modified into a "Burt table" in which the words are intersected to the quotations from 1 to 7.

This table is analyzed through "Correspondence Factor Analysis" so as to trace the way the word has been rated and at the same time to draw statistical conclusions.

Afterwards, the table of answers is analyzed through the method of "Principal Components Analysis"

On the factorial components all words are projected as well as complementary data –elements such as the variables which characterize social, financial and demographic information, as well as questions of behavior and disposition of the people questioned.

The analysis may be enriched by the creation of contingency tables, which complement the researcher's knowledge on the topic under investigation.

Historical retrospection

The initial semiometric analysis of about 11.000 French citizens between 1990 and 2002 demonstrated the stability of the factor axes in relation to the time the samplings were realized and the age and sex of the questioned people.

Thus, in the pole of each axis, a “perception-moral value” was associated with, so that each factor axis was appointed by two contradictory moral values. It should be mentioned that the semiometric plan created in this research, derived from the collaboration between Jean Francois Steiner and the International Association of Communication, Taylor Nelson Sofres.

The complete application of the principles of Semiometry in the market research, presupposes the comparison of the average quotation of the 210 words which were produced by the first population (the one observed by the Sofres Association) to the average quotation of the same words produced by the second population (sample of comparison), based on the statistical test which referred to the control of difference of the two means, in order to specify not only over-rated words, but also the under-rated ones by the questioned people of the sample of comparison. Consecutively, the words of the semiometric plan are located, thus giving the researcher the opportunity to draw his own conclusions.

The semiometric plan

Figure 1 presents the semiometric plan 2X3 in which the perceptions “Pleasure-Duty” (Plaisir- Devoir in French) are juxtaposed, while on the vertical axis (3rd semiometric axis) the perceptions “Attachment-Detachment” (Attachement-Detachement) are contrasted.

At this point, it should be mentioned that the first factorial axis, which is under the name “axis of behavior”, has the characteristic that all the words are arranged on it on the basis of their quotations. Consequently, since the group of words used is regarded with positive grades, it is reasonable that these words are placed on the one side of the axis, whereas few ones are placed on the opposite side.

Statistical processing

The suggested methodology has been applied to 242 students of the 3rd grade of a senior High School. The words used for the particular survey are presented on the table below. The analysis was realized by the software MAD.

Table 1 : The 15 semiometric words of the survey

Words					
W1	Stress	W6	Knowledge	W11	Studies
W2	Absence	W7	Favour	W12	Career
W3	Evaluation	W8	Teacher	W13	Fellow student
W4	Grace	W9	National Exams	W14	T. E. I
W5	Book	W10	Universtiy	W15	Frontistirio- tutorial school

The table of data to be used for further analyses after the transformation of the initial quotations given to the 15 words is presented below:

Table 2: Part of Data Table

IND	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15
I1	1	1	7	1	7	7	7	1	1	1	1	1	1	1	1
I2	4	3	5	4	3	7	3	4	6	7	7	5	6	3	2
I3	1	2	7	4	6	7	7	5	3	5	7	7	7	4	4
I4	7	4	4	6	5	6	5	6	7	6	6	6	7	7	1
I5	1	3	4	3	5	7	7	6	1	7	7	7	7	2	1

I6	2	1	3	1	5	5	6	4	1	6	7	7	6	4	2
I7	3	3	4	4	6	7	6	4	2	6	6	7	7	4	4
I8	4	4	4	4	3	5	6	5	4	4	5	4	7	4	1
.															
.															
.															
I240	I240	5	4	6	6	3	5	4	1	6	1	6	5	4	6
I241	I241	1	1	1	1	7	6	1	1	4	4	4	7	7	7
I242	I242	1	1	6	7	3	6	4	1	7	3	5	7	7	5

Table 3 is derived from Table 2. It presents the general view on how the Greek students graded the 15 words.

Table 3. The grading of the 15 words.

ind	--1--	--2--	--3--	--4--	--5--	--6--	--7--
W1	84	34	34	50	18	7	15
W2	45	30	41	83	15	12	16
W3	30	24	34	66	22	38	28
W4	37	18	29	54	25	36	43
W5	36	14	31	62	43	35	21
W6	14	4	14	27	44	60	79
W7	18	4	15	69	39	51	46
W8	37	16	22	67	32	38	30
W9	90	29	23	35	20	15	30
W10	16	8	8	32	17	47	114
W11	7	6	5	21	27	56	120
W12	10	8	4	37	24	48	111
W13	13	6	8	31	29	35	120
W14	29	9	21	74	35	24	50
W15	56	27	18	53	39	24	25

Based on table 3, the following figure arises.

Table 4

	--1--	--2--	--3--	--4--	--5--	--6--	--7--	TOTAL
SUM	522	237	307	761	429	526	848	3630
AVERAGE	34.80	15.80	20.47	50.73	28.60	35.07	56.53	242
PERCENTAGE	14.38	6.53	8.46	20.96	11.82	14.49	23.36	100

Memorandum: the quotation 522 for instance is the sum of frequency of the grading “1” for the total of 15 words. The quotation 34.80 results from the quotient 522/15. The interpretation of each average quotation is as follows: from the 242 students, 34.80 graded the total of the 15 words with “1”, 15.8 students with “2”, and so on, while 56.53 students (that is 23.36% of the 242 students) used the grade “7”.

It must be indicated that the factors of correlation among the 15 words were – in majority- low. The largest correlation was 0.63 between the words “Evaluation” and “Grade”, followed by the factor 0.59 between the words “University” and “Studies”. The factor of correlation between the words “Studies” and “Career” was 0.57, which is an indicator of the wise choice of the words for this particular survey.

The semiometric plan

The various semiometric axes were formed after having analyzed Table 3, which shows the grading that 242 students gave to 15 words (through the method of Analysis in Main Components), as well as taking into account the students’ sex, how they imagined their University social life, how important they considered the University Degree for their professional career as complementary variables.

The semiometric plan 2X3 (Figure 2) brings on surface the main semiometric structure of the survey, which is the basic aim of the present research. Through application of the method VACOR on the data of Table 3, three classes are constructed. These classes present interesting psychological reactions of the students.

The typology of those three classes (Figure 3) is as follows:

Class 25 = {W5, W6, W7, W8, W15}

Class 26 = {W10, W11, W12, W13, W14}

Class 27 = {W1, W2, W3, W4, W6}

The psychograph of the students who form the three specific above mentioned classes is:

With reference to Class 25: Book (W5), Knowledge (W6), Favour (W7), Teacher (W8), Tutorial School (W15). This class is characterized by the environment where the students' lives take place.

Regardless whether the model of learning applied on the school environment of the survey or not, the "teacher" had always had a role –either central or supporting- in the educational process and the "knowledge" is closely connected to the notion "teacher".

Nevertheless, the word "book" is not possible to be isolated from the word "knowledge" since it contains the recording of "knowledge". Moreover, the "teachers" of various schools become daily objects of comparison with the teachers from the students' "frontistirio (tutorial school)". Yet, "frontistirio (tutorial school)" claim that it aids students to systemize their "knowledge".

The participation of the word "favour" is very interesting within the system of words. Students try – consciously or subconsciously- to gain the "teacher's" "favour" thinking that the "teacher" will pay special attention to his constructive collaboration with the students, so as the individual learning of each student will be promoted and maximized for the national examinations.

Also, "learning" -that is the acquisition of "knowledge" - is an activity completed within the social environment. Additionally, the pursuit of acquiring close personal relationships, as well as the effort of someone to be popular, contains structural elements of someone's social life.

In relation to Class 26: University (W10), Studies (W11), Career (W12), Fellow student (W13), Technological Educational Institute –(T.E.I) (W14). This group is characterized by the concern and anxiety of students for their future.

It is self-evident that in the minds of the students who answered the questionnaire of the present research, the terms "studies", "University" and "TEI (Technological Educational Institute)" are correlated.

Besides this, the students participated in the present survey just a few days before the national examinations and consequently the institutes they chose for their academic studies were the Greek "University" and the "TEI". So, they had no reason to dissociate "University" and "TEI" from their "studies".

Similarly, the correlation of "Studies" and "Career" is quite logical, since in contemporary Greece, due to over-offering of employment on one hand and decrease of working places on the other, youngsters tend to identify "Career" and successful professional life with the acquisition of loads of qualifications.

It is also of big interest, the correlation between the terms "Fellow student" and "Studies", "University", "TEI" and "Career". This can be rather explained by the insecurity of the Greek young people for the social life that lies in front of them. They want their "Fellow students" whom they already know and trust, as fellow travellers to the unknown and unfamiliar surroundings of the University and perhaps of the new city they are going to study at.

They have grown up with their "fellow students", they have acquired together self-awareness and realised how human relations function. Collaborators, friends, professional relations and generally every relation that someone has or does as an adult, is seen under the scope of personal profit and benefit by the students who seem to know a lot about the lives of the grown ups and how difficult are guileless acquaintances in the world of adults.

Thus, they correlate their "fellow student" with their studies because they want to have a stable social life which is about to be transformed very soon.

In relation to Class 27: Stress (W1), Absence (W2), Evaluation (W3), Grades (W4), National Examinations (W9). This group is characterized by the stress which possesses the students' everyday lives.

School life is a period of transition. At the end of this period, the students are given the opportunity to fulfil one of their main ambitions, such as professional high salaries during the rest of their lives. The fulfilment of this ambition is considered to be achieved through the "national examinations". The pressure that students face at the period of those exams either directly as an objectively difficult task, or indirectly as a demand of their family or the society in general for higher education undermines their psychological well-being and their health.

All those elements that contain part of the Greek Secondary Educational System in Senior High Schools in particular, charge the students with sentiments of "stress" and anxiety. This daily "stress" that Secondary School student experience is connected to the word "absence", because the absence from either the school or the tutorial school might be fatal in the eyes of the students, since that particular day of the student's absence the teacher might give educational clarifications of vital importance.

Since “stress” is -especially nowadays- a common human sentiment under circumstances of high pressure, it is possible to be connected to “Absence” from school, a fact which may have negative consequences for the student’s personal preparation for the national exams.

Moreover, “stress” is undoubtedly connected to “Evaluation”, because evaluation at school is for the student a general test before the national exams, something like the “dress rehearsal” in theatre.

By extension, “stress” is connected to “Grades”, as school grades include the qualitative expression of a student’s evaluation.

Conclusion

It is common knowledge that words, apart from the memories that raise to people, have the power to evoke pleasant or unpleasant feelings. Taking advantage of those properties of the words we are in position to create very simple questionnaires for the market research, which are “neutral”, that is to say “questionnaires not guided by the researcher towards certain answers”.

Generally, the suggested by this paper technique of questionnaires’ processing targets at the evaluation of the asked persons’ feelings, which are evoked by the hearing of a certain and limited amount of words, which are all relevant to the subject of the research. The decision of the words’ selection and listing seems arbitrary at first sight. However, it aims at the tracing and bringing on surface of the innermost thoughts of the persons under question. Those thoughts might not have been revealed through a different form of questions.

Conclusively, this proposed approach for questionnaires’ processing offers the researcher an unprecedented experience. To be more specific, the proposed technique:

- i) Does not aim at collecting opinions via questions that are presented in the form of a sentence. For such questions the researcher not only has difficulty in proposing scaled answers, but he is also obliged to make long questions in order to be understood by the person under question.
- ii) The number of questions –using this method- is undoubtedly limited, and therefore the time needed to fill in the questionnaire is limited too. Those two are basic for the reliability of the answers parameters.

References

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Appendix

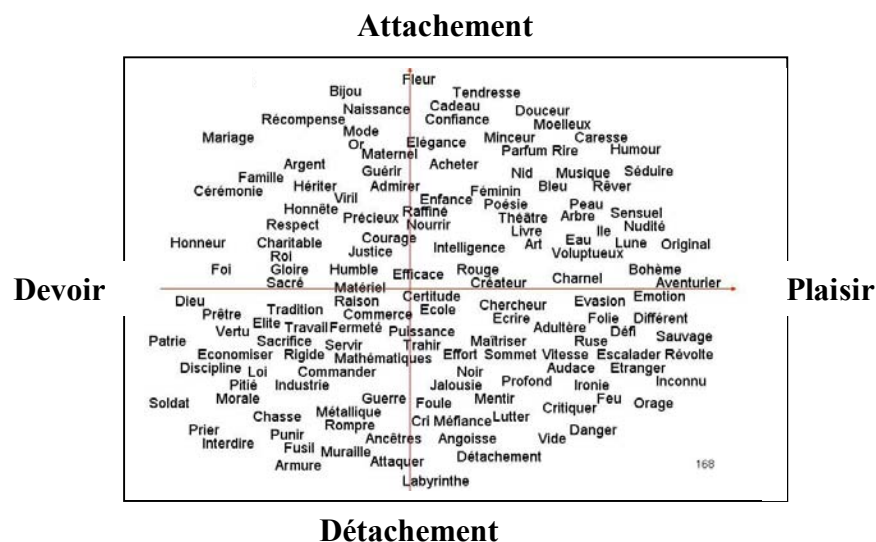


Figure1: Classic Semiotic plan

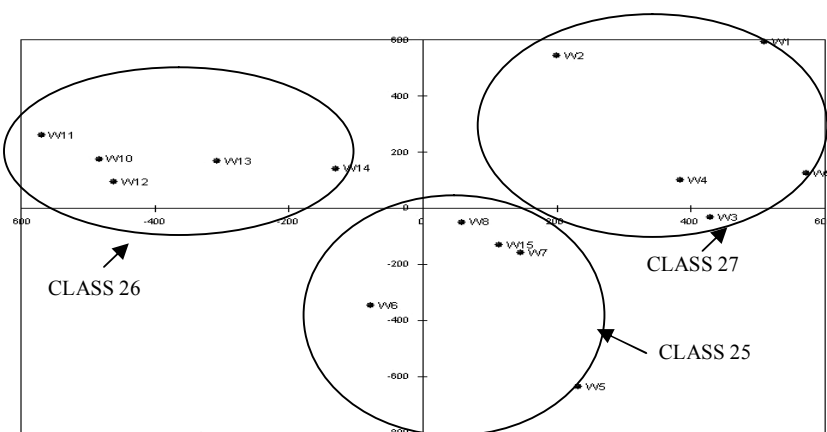


Figure 2: Semiotic plan 2x3 of the present research

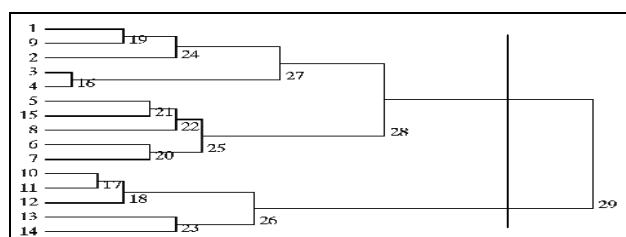


Figure 3: Dendrogramme for 15 words