

ONICESCU'S INFORMATIONAL STATISTICS AND THE POEM

MIHAITA NICULAE

PHD UNIVERSITY PROFESSOR

Academy of Economic Studies in Bucharest,

Faculty of Cybernetics, Statistics and Economic Informatics

Vice-President of Cybernetics Academy "Stefan Odobleja"

Phone: 0723301134, E-mail: nmihaita@opensys.ro

The relations' functional durability is given by their repeatability. A major purpose in science is to allow natural phenomenal prediction. This goal is attained by discovering the systematic relations between predictive variables and outdoor variables, and obtained as a result effects, reactions. In analyzing the Poem we'll use Inferential Statistics, experimental plans with three factors at two levels and Informational Statistics (Shannon/Onicescu).

INFERENCE STATISTICS

We will restrict our attention to a few bivariate inferential tests. One bivariate inference test will be discussed and applied in the main body of this paragraph, namely the chi-square test and Cramer's V, which is appropriate for examining the relationship between two nominal variables.

The key concept and operative word in analyzing the Poem is „relationship“. The relationship concept, albeit simplicity itself, has tested any manner of perspicacity to which many authors may previously have laid claim. What, for example, is a relationship? Where is it found? How and When does it occur? And Why? Finally, what purpose does the investigation of such a nebulous concept serve? Can one approach a busy writer or a scientist and honestly demonstrate the utility of this, and why not thru the Information Theory or Informational Statistics concepts?

Classifying relationships challenges the imagination and exhausts the challenger. Relationships are political, economic and social or literarily, existing without number in the environment. On the other hand, they can be physical or metaphysical, predictable or unpredictable, good or bad, progressing or regressing, mundane or crucial..., or just plain ornery. We will search for meaningful relationship in the jungle of the Poet feelings, with only „defining attributes“ as our flimsy snare.

As we told in the previous article EUROPEAN CULTURAL VALUES: POETRY AND STATISTICS, we will use the same robust approach, for example the relative frequency, consisting in a great number of observations (statistic evaluation), as probability.

1. The Chi-Square and Cramers'V Tests

However, let us return to the poem "The Star/Aster/Lucifer (Luceafarul)". The initial variant, the eminescian one, has 98 stanzas. In other editorial appearances Maiorescu (Romanian editor and critic) publishes variants of 94 stanzas (let alone 4 stanzas of God's

discourse), also modifying some verses. For the statistic and mathematic constructions we will use the following concept of a paradigm¹⁴³. Distich that is each of the numbered paragraphs, which contain couples of verses with a distinct metric structure which divides the poem, verses which have a meaning on their own. For example the distiches number 25 and 26 are:

*Come down, good Lucifer and kind/ O lord of my aspire
And flood my chamber and my mind/With your sweetest fire!*

If we take the verses into consideration, Eminescu's variant consists of 392 verses that are 196 distiches, a community, representative for the numbers and for the multitude of events and possible interpretations.

For example we create tables 1-4 of the synthesis of existence or non-existence of the two main characters in the first 49 stanzas that is 98 distiches taking into consideration the communication process and another 98 distiches in the absence of communication.

Table 1. Cross Tabulation with the Lucifer and Catalina' presence or not in the odd distiches when communication is ON.

Number of odd distiches	Characters	Lucifer	Code B	
in the	Catalina code A	In distich	Absent	total
presence of	In distich	27	13	40
Communication	Absent	15	0	15
Code C	Total	42	13	55

Table 2. Cross Tabulation with the Lucifer and Catalina' presence or not in the odd distiches when communication is OFF.

Number of odd distiches	Characters	Lucifer	Code B	
in the	Catalina code A	In distich	Absent	total
absence of	In distich	5	9	14
Communication	Absent	19	10	29
Code C	Total	24	19	43

Table 3. Cross Tabulation with the Lucifer and Catalina' presence or not in the even distiches when communication is ON.

Number of even distiches	Characters	Lucifer	Code B	
in the	Catalina code A	In distich	Absent	total
presence of	In distich	23	15	38
Communication	Absent	15	0	15
Code C	Total	38	13	53

¹⁴³ Paradigm = totality of flexible forms of a word, system of concepts accepted by a group of specialists for rapid use, frame of word's forms, used as an example for the inflexion of a language element or of a class of language elements. DEX – dictionary, The Academy Publishing House, 1975.

Table 4. Contingency table with the Lucifer and Catalina' presence or not in the even distiches when communication is OFF.

Number of even distiches	Characters	Lucifer	Code B	
in the	Catalina code A	In distich	Absent	total
absence of	In distich	3	12	15
Communication	Absent	20	10	30
Code C	Total	23	13	45

We compute, the Chi-squares and Cramer's V for each cross tabulation in one classic way:

$$\chi^2_c = \sum_{i=1}^r \sum_{j=1}^c \frac{(x_{ij} - \theta_{ij})^2}{\theta_{ij}} \quad (1)$$

Cramer's V, in short V it is.

$$V = \sqrt{\frac{\chi^2}{(N) \text{Min}(r-1, c-1)}} \quad (2)$$

Applying formulas number (1) and (2) we obtain potential relationships over the data from tables 1-4 in this way: moderate toward strong (1, association coefficient 0,34; 2, association coeff. 0,28, 3, association coeff. 0,39,4, association coefficient 0,44).

Taking into account the factorial experiment with trei factors at two levels where replications are the odd and even distiches, we obtain potential relationships between **Catalina** and **Communication** and moderate between **Lucifer** and **Catalina** or **Lucifer** and **Communication**.

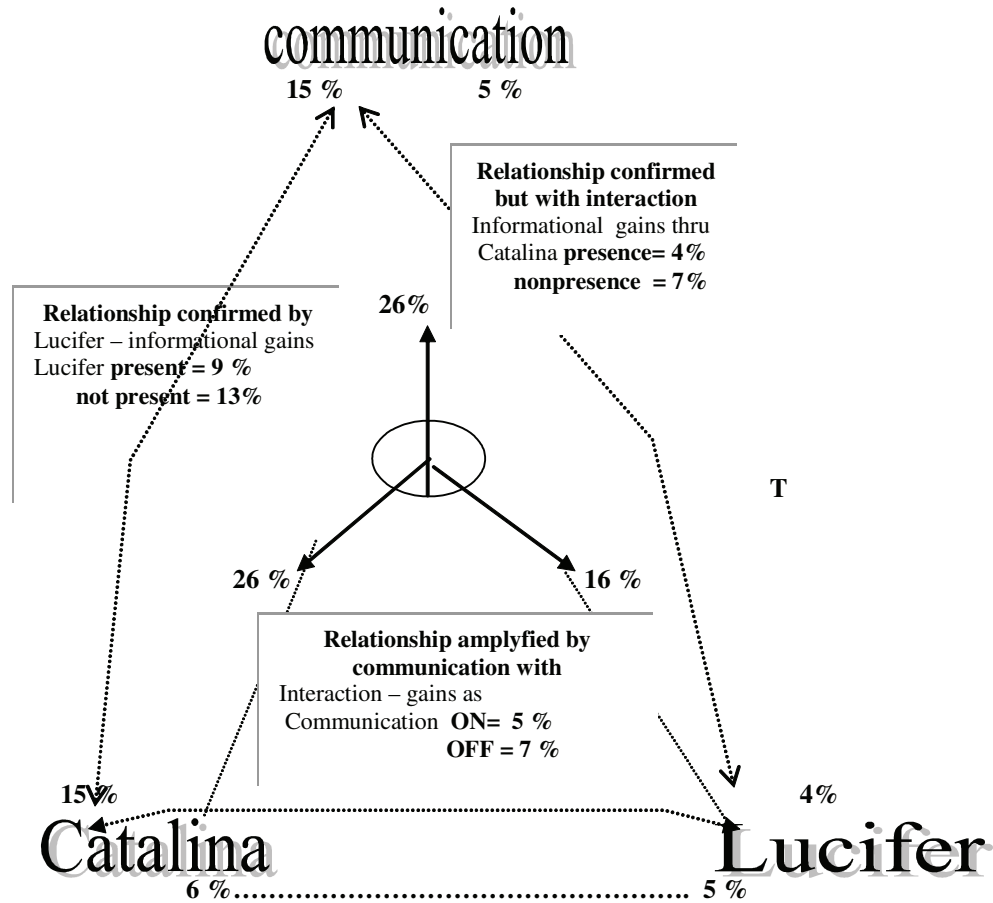
1.2. Informational Statistics

We use Onicescu's Informational Statistics for more accuracy thru measurement. Table 5 is filled with the final results of informational gains obtained in conformity with the calculus contained in the Image 1. More than that we find the negative interactions that make hidden relationships or spurious and positive interaction that make stronger interaction by synergy. The Ideogram filled the gaps.

Table 5

Informational gains thru combinations	2	Interaction +/-	
		3	4
1			
Communication x Catalina toward	Lucifer	16 %	-6 %
Communication x Lucifer toward	Catalina	26 %	-5 %
Lucifer x Catalina toward	communication	26 %	-6 %

Ideogram no. 1. Identifying first order relationships using Onicescu's Informational Statistics and informational gains between two and an intervening variable.

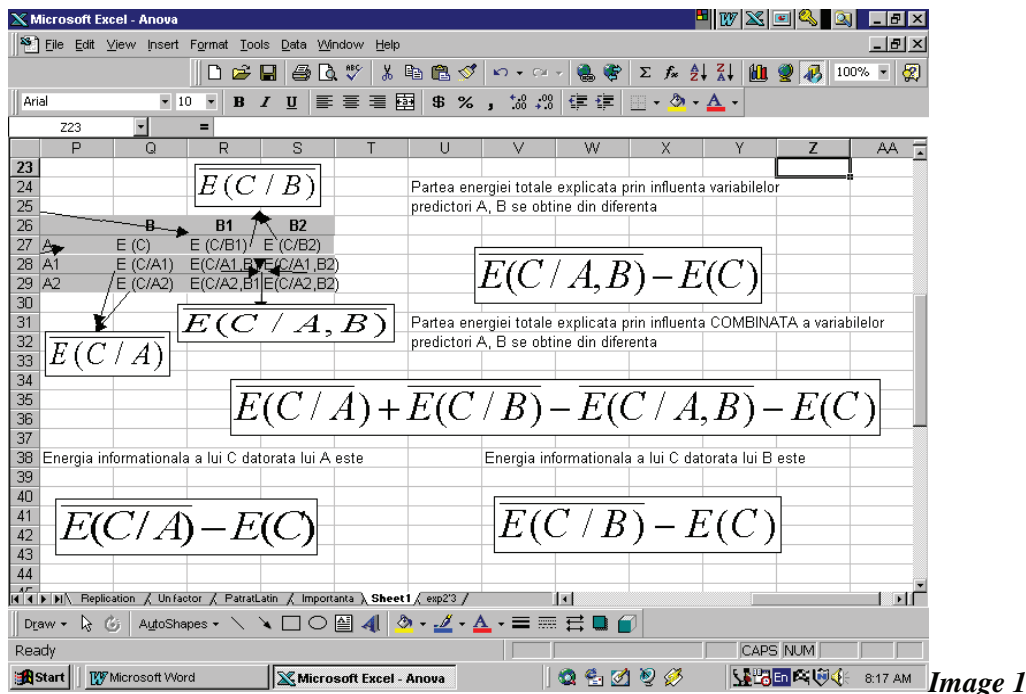


The detail model is

$$AI(B/A) = \overline{E(B/A, C)} - E(B) + \overline{E(B/A, c_0)} - E(B/c_0) + \overline{E(B/A, c_1)} - E(B/c_1)$$

and the synthetic one is:

$$AI(B/A) = \overline{E(B/A)} - E(B)$$



The ideogram no.1 shows a synthesis of direct relationships confirmed by using classical statistics from above, meaning a stronger relationships between Catalina and Communication process, a relative potential meaning weak relationship between Lucifer and Catalina and weaker between Lucifer and Communication process, using factorial experiments analysis meant above.

More than that, shows how a third variable amplify or reduce, connect in positive and negative interaction in such a way that the relationships reveals hidden aspects or false one, spurious branches or vigorous ones.

Working out with statistical tools both traditional or modern only add value to the geniality of great poets as Eminescu in Romania and the quest of finding hidden relationships worth a lot.

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