

The influence of art upon the feeling of life fulfilment

Iuliana COMAN

Iuliana.Coman.ARDS@gmail.com

The aim of this paper is to analyse the influence of art upon the feeling of life fulfilment and the participation of art to the consolidation of the community.

The analysis is performed using data obtained from an experimental study on a sample of 120 persons with higher education in the south of Romania. Data were analysed using SPSS and Microsoft Excel and contain descriptive tables. The analysis took into consideration the comparison of the results obtained using a variety of statistical methods.

Following the analysis, it was concluded that the presence of art both influence the feeling of life fulfilment and contributes to the consolidation of the community.

Keywords: Art, Society, Statistics

1 Introduction

The hypothesis used in the development of this study is the major influence that art has on society, building, beyond the cultural identity that decisively defines a community, the necessary framework that ensures the progress both at the individual level and at the society level.

Starting from this hypothesis is also followed an assessment of the impact of art on the social context and on individual. The analysis aims both to obtain an image of the art impact and the identification of the dynamics that are manifesting in this market.

The influence of art upon the life of individuals and upon the life of society was the subject of several studies organized during last years. The capacity of art to influence the life of individuals was analysed in the study moderate by Sorensen, (2011), and the study presents the incontestable impact of art on researchers' life, in society and into individuals' life.

Pantano published her research (2011) revelling the influence of culture on the behaviour of consumers of local products in the Calabria area. The results of the study show the major influence which culture has on consumers behaviour. Bachleda and Bennani (2016) describe the impact of the psychological components on the visual arts, and the

results show that the most powerful influence on the behaviour of visual art consumers are several traits of personality.

Croitoru and Becuț (2017), presents the tendency manifested at international level to evaluate the impact of art in the social and economic environment. Studies organized in France or Canada, demonstrate that art has a strong influence in society, developing the independence of individuals, expanding the capacity of knowledge, developing the understanding and the ability to act. Also, art participates in building social cohesion and developing society by encouraging civic participation.

2. Metodology

For this analyse, an experimental study was organised, on a sample of 120 people. The aim was to identify the influence of art on the population with higher education in the south of Romania. This target group was selected in since the high level of education implies a consistent exposure of this segment of the population to the interaction with art and that context allows a deeper analysis of the impact of art upon the population.

In defining the questionnaire, different studies and the statistical analyses carried out in recent years in the field of art was taken into consideration, allowing the identification of the main factors which are manifesting in this field.

Among the most important factors included in the questionnaire are those analysed in this paper: the presence of art in the lives of the respondents, the feeling of fulfilment in life, the material comfort and the participation of the art in strengthening the society.

Statistical Methods

The statistical methods used to analyze the associations in this paper are the following: Yule coefficient, Chi Square

Method and Cramer’s V test, Onicescu Informational Correlation.

The coefficient of association Yule

The coefficient of association Yule implies the drawing up of an association table for the variables of alternative type (YES / NO; F / M; etc.). The association table consists of two rows and two columns, in which at the end of the rows the values of the two associated characteristics are passed, and within the table the corresponding frequencies are passed.

Table. 1. Example: Cross Table Considerations regarding Art Presence and Art Influence upon life fulfilment

		Do you consider that Art was present in your life		
		Disagreement or partial accord	Total Acord	Grand Total
Do you consider that you have a fulfilled life	Disagreement or partial accord	53	19	72
	Total Acord	19	29	48
	Grand Total	72	48	120

Source: Authors’ own research

To determine the numerical value of the association coefficient indicating the existence and intensity of the connection, the coefficient of Yule is calculated according to the relation:

$$Q = \frac{(n_{11} * n_{22} - n_{21} * n_{12})}{(n_{11} * n_{22} + n_{21} * n_{12})};$$

$$Q \in [-1, 1]$$

If: $Q = 0$ lack of association between x_i și y_i
 $Q \rightarrow 0$ weak association between x_i și y_i
 $Q \rightarrow \pm 1$ strong association between x_i și y_i
 $Q = \pm 1$ perfect association between x_i și y_i

Chi Square and Cramer’s V Test – Assessment of the influence manifested between two variables

Chi square test was one of the methods used for the analysis of the influences that manifesting in the world of art. (Coman, Mihaita, 2019). The method is used to identify the relationships between factors, is also called the Chi Square method, the association test, Chi, Hi or X2. The test was introduced by Karl Pearson (1857-1936) in 1900 and involves the verification of the hypothesis of association between the answers obtained in a questionnaire to the alternatives of a question and the verification of a certain data set that may follow a known statistical distribution.

The method include the definition of cross tables of the results intersecting the answers of two questions X with the alternatives X_i , where $i = 1, \dots, r$ placed as rows (r) of the table, and Y with the alternatives Y_j , with $j = 1, \dots, c$ placed in columns (c) of that table.

The questions considered as segmentation variables (independent, causal, extrinsic, exogenous) were placed in the columns of the table.

A concrete example of a cross Table was presented above - Cross Table Considerations regarding Art Presence and Art Influence upon life fulfilment.

The methodology for identifying the potential relationships include the next steps:

1. Formulation of the null hypothesis H0, which states that between the two variables-segmentation questions there is no causal link or association;
2. Choosing the significance level or threshold α and calculating the number of degrees of freedom of the table according to the formula $(r-1)(c-1)$; based on these data, one assumes from the table of distribution χ^2 its value, theoretically (index t);
3. Calculating the expected theoretical frequencies (expected, in case of a homogeneity test), according to the following formula:

$$\theta_{ij} = (\text{Total Line } i \times \text{Total Line } j) / \text{Total General} = T_i \cdot T_j / T..$$

4. Calculation of χ^2 (index c) using the formula:

$$\chi^2 = \sum_{i=1}^r \sum_{j=1}^c [(x_{ij} - \theta_{ij})^2 / \theta_{ij}]$$

5. χ^2 is compared with the one obtained from the distribution table χ^2 as follows:
 - if χ^2 calculated $> \chi^2$ theoretical, the null hypothesis is rejected and therefore there is an association or potential relationship between the studied segmentation variables;
 - if χ^2 calculated $< \chi^2$ theoretical, the null hypothesis is accepted and therefore there is no association or potential relationship between the studied segmentation variables.

After identifying the existence of the association between the segmentation

variables, the Cramer's V test is used to verify how strong the connection between the two variables is.

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

The scale of values that Cramer' V can have is the following:

(0 - 0.10]	(0.10 - 0.3]	(0.3 - 0.5]	(0.5 - 0.7]	(0.7 - 1]
There is no association	weak association	Mode rate association	Stron g associ ation	Very strong associ ation

Informational Energy Onicescu

The description of the method of calculating the Informational Energy, according to Rizescu and Avram (2014), and Mihaiță (1983), includes the aspects presented below. Informational Energy Onicescu comprises the amount of information generated by the diversity of a context. If we take in consideration a system S characterized by the states s_1, s_2, \dots, s_n having the corresponding weights p_1, p_2, \dots, p_n , where $\sum_{i=1}^n p_i = 1$.

The Onicescu Information Energy of the S system is calculated as the sum of the squares of the weights of the individual states:

$$E_s = \sum_{i=1}^n p_i^2 .$$

The information energy values range from $1/n$ to 1, ($1/n \leq E_s \leq 1$).

The Information Energy reaches the value $1/n$ when all the states have the same weight $1/n$ (the uniformity of the system achieved) and 1 when one of the states of the system has a weight of 1 (and therefore all the other 0).

The information energy decreases in direct proportion with the increase of uniformity, or determination of systems. The information energy increases in direct proportion as the differentiation of the system increases.

The informational energy of a system composed of two or more independent elements is the product of their corresponding informational energies.

Onicescu Informational Correlation

Academician Octav Onicescu (1892-1983), is one of the greatest mathematicians of Romania with a remarkable international reputation. The basic concept of Onicescu information statistics is the Onicescu Information Correlation. This is a coefficient that has a remarkable property, namely its equality with 1 represents the identity of the distributions. In order to describe the Onicescu Information Correlation, the methodology presented by Oprea (2017), Mihaita and Capota (2005) or Onicescu (1971) were used.

If we consider two experiments A and B, characterized by a system with n events: A1, A2, ..., An and B1, B2, ..., Bn, with the following probability distributions: p

(A1) = p1, p (A2) = p2,..., p (An) = pn; p (B1) = q1, p (B2) = q2, ..., p (Bn) = qn. The Onicescu Information Correlation between A and B, denoted IC (A, B) can be calculated with the following formula:

$$IC(A, B) = \sum_{i=1}^n p_i q_i$$

Information correlation can take values between 0 and 1.

$$0 < IC(A,B) < 1$$

The information correlation allows us to quantify the association between two event systems having common characteristics.

The influence of the presence of art on the feeling of fulfillment in life.

The analysis starts with the assessment of the association between these two factors using the Chi Square method.

Table 2. Contingency table Presence of the Art - The feeling of life fulfillment

Presence of the Art /The feeling of life fulfillment	Disagreement or Partial Accord	Total Accord	Grand Total
Disagreement or Partial Accord	53	19	72
Total Accord	19	29	48
Grand Total	72	48	120

Source: Authors' own research

Table 3. Table Calculation Chi Square - Optimized Distributions Art Presence - The feeling of fulfillment in life

	Disagreement or Partial Accord	Total Accord	Grand Total	Hi ²	C'S V
Disagreement or Partial Accord	43.2	28.8	72.0	13.8	0.34
Total Accord	28.8	19.2	48		
Grand Total					

Source: Authors' own research

Chi Square analysis reveals a moderate association, Cramer's V is 0.35 (between 0.3 and 0.5).

For the calculation of the Yule coefficient was constructed a table in which in addition to the contingency table was

included a column with the Product of the two diagonals.

On the total line of this column, is included R = the ratio of the two products. The Yule coefficient is calculated as Yule = (R-1) / (R + 1)

Table 4. Calculation Table for Yule Coefficient - Association between Presence of Art - Feeling of Life fulfilment

Cause (Presence of Art) / Effect (Life Fulfilment)	Disagreement or Partial Accord	Total Accord	Total	Product of diagonals	Yule
Disagreement or Partial Accord	53	19	72	1537	
Total Accord	19	29	48	361	
Total	72	48	120	4.26	62%

Source: Authors' own research

The table shows that the Yule coefficient also gives the same perspective - a moderate association between the two variables.

Going further, Onicescu Informational Correlation Coefficient is included. To calculate this coefficient a table is developed, starting from the table of contingency of the two variables two new columns.

In the first new column is included the Informational Energy of those two alternatives, on the total line of this column is included the sum of the two informational energies - representing the Informational Energy of the system.

In the second column is calculated the sum of the squares of the weights of the two segments generated by the effect variable, applied in turn in each of the two segments generated by the cause variable.

In the first line of the column is placed the square of the weights of the segments generated by the variable effect on the first segment generated by the variable cause, and in the second the square of the

weights generated by the variable effect in the second segment generated by the variable cause.

In the last line of the column (total line), is calculated the Onicescu Correlation Coefficient as a ratio between the Informational Energy and radically from the product of the two values in line 1 and line 2 of the same column.

Table 5. Table Calculation for the Coefficient of Correlation Onicescu - Association of the Present Art and the Feeling of life fulfilment

Cause (Presence of Art) / Effect (Life Fulfillment)	Disagreement or Partial Accord	Total Accord	Total	Informational Energy	Kor
Disagreement or Partial Accord	53	19	72	0.29	0.61
Total Accord	19	29	48	0.16	0.52
Total	72	48	120	0.45	0.80

Source: Authors' own research

Onicescu Informational Correlation Coefficient also indicates the presence of an association between the two analysed variables.

A first conclusion can be reached: the presence of art has an influence upon the feeling of fulfilment in life.

The influence of material comfort on the feeling of fulfillment in life

The three methods described above will be applied for analysing the association

between material strength and the feeling of life fulfilment.

Table 6. Contingency table Material Comfort - The Sentiment of Fulfilment in life

		Acord Comfort Material		
		Disagreement or Partial Accord	Total Accord	Grand Total
Do you consider that you have a fulfilled life	Disagreement or Partial Accord	64	20	84
	Total Accord	8	28	36
	Grand Total	72	48	120

Source: Authors' own research

Table 7. Calculation table for Chi Square - Optimized distributions Material comfort and Feeling of Life fulfilment

	Disagreement or Partial Accord	Total Accord	Grand Total	Hi Patrat	CRAMER'S V
Disagreement or Partial Accord	50.4	33.6	84.0	30.58	0.505
Total Accord	21.6	14.4	36		
Grand Total					

Source: Authors' own research

The table reveal that a strong association is present between material comfort and

the feeling of life fulfilment. Cramer's V coefficient is in the range 0.5 - 0.7.

Table 8. Yule Calculation Table - Material Comfort Association - The Sentiment of Fulfilment in Life

Cause (Material Comfort)/ Effect (Life Fulfilment)	Disagreement or Partial Accord	Total Accord	Total	Product of diagonals	Yule
Disagreement or Partial Accord	64	20	84	1792	
Total Accord	8	28	36	160	
Total	72	48	120	11.20	84%

Source: Authors' own research

Yule coefficient also confirms the strong association between the two variables.

Table 9. Table Calculation for the Coefficient of Correlation Onicescu - Material Comfort Association - Sentiment of Life Fulfilment

Cause (Material Comfort)/ Effect (Life Fulfilment)	Disagreement or Partial Accord	Total Accord	Total	Informational Energie	Kcor
Disagreement or Partial Accord	64	20	84	0.37	0.80
Total Accord	8	28	36	0.06	0.51
Total	72	48	120	0.44	0.68

Source: Authors' own research

Also, the Onicescu Correlation Coefficient offers the same perspective: a strong association is identified.

A second conclusion could be the next: variables material comfort and the feeling of fulfilment in life are in a strong association, with a strong influence. More than this the influence identified is stronger than the influence between the presence of art and the feeling of life fulfilment.

The influence of the presence of art in the consolidation of community

The statistical methods presented were used for assessment of the association existing between the Presence of Art and the conviction regarding the capacity of art to participate to the Consolidation of the society.

Tab 10. Contingency table Presence of Art - Consolidation of the society

		Presence of art		
		Disagreement or Partial Accord	Total Accord	Grand Total
Consolidation of the community	Disagreement or Partial Accord	41	9	50
	Total Accord	31	39	70
	Grand Total	72	48	120

Source: Authors' own research

Tab 11. Table Calculation of Chi Square - Optimized Distributions Art Presence - Company Consolidation

	Disagreement or Partial Accord	Total Accord	Grand Total	Chi Square	CRAMER'S V
Disagreement or Partial Accord	30.0	20.0	50.0	17.29	0.38
Total Accord	42.0	28.0	70		
Grand Total					

Source: Authors' own research

According to the analyse an average association is revealed. In fact, was identified a stronger association comparing to the association between the Presence of art and the Feeling of Life Fulfilment and, a weaker association of it is compared with the association between the Material Comfort and the Feeling of Life Fulfilment.

Table 12. Table for Calculation of Yule coefficient - Association between Presence of Art and Consolidation of the society

Cause (Presence of Art)/ Effect (Consolidation of the community)	Disagreement or Partial Accord	Total Accord	Total	Product of diagonals	Yule
Disagreement or Partial Accord	41	9	50	1599	
Total Accord	31	39	70	279	
Total	72	48	120	5.73	70%

Source: Authors' own research

The calculation reveals the existence of an association. The value of the Yule coefficient is between the value of the coefficient calculated for the association Presence of Art - Life Fulfillment and the one calculated for the association of Material Comfort - Life fulfillment.

Table 13. Calculation Table for the Coefficient of Correlation Onicescu - Material Comfort Association - Sentiment of Life Fulfilment

Cause (Material Comfort)/ Effect (Life Fulfilment)	Disagreement or Partial Accord	Total Accord	Total	Informational Energy	K correlation
Disagreement or Partial Accord	64	20	84	0.37	0.80
Total Accord	8	28	36	0.06	0.51
Total	72	48	120	0.44	0.68

Source: Authors' own research

The Coefficient of Correlation Onicescu take a value situated between those calculated for previous associations. The Onicescu correlation coefficient calculated for the association of Life fulfillment - Material comfort is found between the coefficient calculated for the association between the Presence of the art and Life fulfillment and the coefficient for the association of Material comfort - Life fulfillment.

Conclusions

Although at an intuitive level is considered that art has an influence on each one of us, or on society, in this paper these influences of art are analysed using statistical methodologies.

Art is present in the life of respondents, only 6% of respondents expressed their disagreement (total or partial) regarding the presence of art in their life. In the same time, most of respondents (81%) consider that art influence the life of respondents. The

analysis carried out went more in depth and confirmed that Presence of art manifest an influence upon the sentiment of Life Fulfilment. The results of the analysis revealed the existence of a moderate influence of the art's presence upon the feeling of life fulfilment.

91% of the respondents consider that art participate to the consolidation of the community and of the society. Also, the presence of art manifests an influence upon the conviction regarding the capacity of art to participate to the consolidation of the community, which is another conclusion of the analysis carried out.

Moreover, the influence of art upon the conviction regarding the consolidation of society has proved to be stronger if is compared with the influence of presence of art upon the feeling of life fulfilment.

It should also be mentioned that the analysis was carried out using three statistical methods (Chi Square Method and Cramer's V Test, Yule Coefficient and Onicescu Informational Correlation), all of them revealed the same influences and similar intensities of the analysed associations.

References

- [1] Bachled, C. L., Asmae, B., (2016), Personality and interest in the visual arts, Arts and the Market, Emerald Publishing
 [2] Croitoru, C., Becuț, A., Institutului National de Statistica (2017) Barometrul

de Consum Cultural O radiografie a practicilor de consum cultural. 2017 Edition

- [3] Coman, I., Mihaita, N. (2019) Factors influencing the impact of Art on the life satisfaction, Proceedings of the 8th INTERNATIONAL CONFERENCE SYNERGIES în COMMUNICATION Bucharest, ASE, Romania

- [4] Rizescu, D., Avram, A., (2014) Using Onicescu's Informational Energy to Approximate Social Entropy, Procedia - Social and Behavioral Sciences · February 2014

- [5] Mihaita, N., Stanciu-Capota, R., (2005) Relations statistiques fortes, cachees, fausses, et illusories Applications de la statistique informationelle - edition bilingue, Publishing House ASE

- [6] Mihăiță N. (1983) Onicescu Information Statistics în a Multiple Marketing Data Proces și ng Methodology, Economic Computation and Economic Cybernetic Studies and Research, review no. 2.

- [7] Oprea, M., (2017) An Overview on the Contributions of the Academician Octav Onicescu to the Informational Statistics and Further Developments, International Conference on Virtual Learning VIRTUAL LEARNING – VIRTUAL REALITY.

- [8] Pantano, E., (2011), Cultural factors affecting consumer behavior: a new perception model, Euromed journal of business, 2011

- [9] Sorensen, D., (2013), Advancing Fields of Knowledge, Harvard Web Publishing.



Iuliana Coman

PhD Candidate

CSIE, ASE, Bucuresti

Iuliana Coman graduated from the Faculty of Cybernetics, Statistics and Economic Informatics of the Academy of Economic Studies in 1997.

Her experience includes over 20 years of expertise in Marketing Management in important companies, leaders in the Romanian market – Dacia Renault Nissan, Altex Romana, Mediafax, Toyota Romania, GfK Romania.