DOI: https://doi.org/10.26397/RCE2067053243

Is the old communist brand preferred by the young consumers? A country of origin study case with multimethod analysis

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Abstract
The market of durable goods from Romania is characterized by numerous particularities In the case of buyers, the most often used and the most influential promoting tools are the ads presented on TV. The Romanian producers being represented on this market by the Arctic brand (old communist Romanian brand). This research studies the preferences of the Romanian young consumers concerning brands of durable goods which are promoted by means of advertising videos complementary using – two non-parametric tests (for the first time for marketing data), respective Friedman test (very often applied in medicine and machine learning) and Kolmogorov – Smirnov test.The results shows that young consumer prefer an old communist brand like Arctic and there are no social–demographic differences between the preferences of the Arctic brand. We consider the results of this research as being important because, in the current global durable goods market, the primary role of advertising is to help build brands (Copley, 2004, p 110). Producers and distributors have to adapt their offer to the particularities of the Romanian market. One of the statistics tools, the Friedman test was used for the first time in testing the TV advertising preferences, as it is more often applied in medical domain and learning machine.

Keywords: country of origin, advertising, durable goods, Romanian consumers, brands, Friedman test, Kolmogorov – Smirnov test;

1. Introduction

Particularities of Romanian durables goods market

The purpose of marketing research results is not to obtain results and to transfer them to decision structures within an organization but – according to statistics law – the inference in the general population. Statistics offers marketing researchers classical statistics data, parametric, applicable for metric data but also numerous tests adapted to qualitative data particularities respective non-parametric tests.

In a previously researches in the durable goods field in Romania (on a sample group of 300 representative households for urban national level) the following particular aspects from Romanian market were finding:

• After processing the survey data through horizontal analyses, it has resulted the fact that in the acquisition of durable goods process, the order of the attributes which are taken into account is the following: *the product quality, the price, the relation quality – price, technical performances, the guarantee, energetic consumption class, the brand, the discounts, the design of the product, post-selling service, the skills of the selling staff and the name of the shop* (Gabor et al. 2009), (Gabor 2013), (Gabor 2014);

• Through applying principal component analysis method (PCA), it has been found out that, the attributes which are related to the promotion policy of these products are grouped in the following: *the brand of the product, the name of the shop, the design of the product and the skills of the selling staff*, these variables forming the principal component which explains 26,5% from the total variance (those from point one) (Gabor 2012);

• 51,13 % from the households of the group sample in research prefer durable goods made by foreign brands and only 33,71% prefer Romanian brands (Gabor & Isaic – Maniu 2011a);

• The most important promotional influences are in order of importance: *TV advertisings* (43%), *advice received from friends and acquaintances* (38 %), in a relatively equal proportion (26 %, 25 %, 24 %) – *the same brand used, warranty provided and promotional leaflets of shops*, promotional leaflets of brands (19 %), the lowest influences (about 8 %) belonging to: street panels, internet advertising, press

advertisings, radio advertisings and posters in or on the public means, only 11 % of respondents not being influenced by any of the aforesaid versions (Gabor & Isaic – Maniu 2011b);

• Through applying *the discriminant analysis* to durable goods brands preferred by the households from the sample group, resulted that, the predominant preference for foreign brands is best discriminated by the socio-demographic characteristics *the monthly income* achieved by the head of the family and their *level of education* (Gabor & Isaic – Maniu 2011a);

• Applying *the factorial analysis of correspondences* to the main information sources used by Romanian households in the durable goods acquisition process, this method has helped to the separation, on age groups, of these sources, emphasizing the connections which exist between the modalities of the two qualitative variables, factorial axe 1 belonging to old people, aged over 50 and factorial axe 2 to young family heads, aged under 35 years (Gabor & Isaic – Maniu 2011b);

• Also, through applying *parametric inferential statistics,* respective *t Student test*, it has reached the conclusion that, between the eight development regions of Romania there are significant differences referring to the endowment degree of the households with durable goods, aspect which has to be taken into account in conceiving the promoting strategies and policies of the active brands on this market (Gabor et al. 2011);

• Romanian young consumers prefer the TV advertising carried-out in Romania to another durable commodity, whose history began in the communist period as well and that, by means of the Renault concern has become a global brand, Dacia Logan brand, respectively to the prejudice of the car brands ranked in Top 100 Global Brands, as for example Mercedes, Toyota etc. (Gabor & Conțiu 2012).

History and post-communist development of the Arctic brand

The Arctic brand (part of the Arclik group – the third European appliances producer -, its portfolio comprising 10 brands: Arcelik, Beko, Grundig, Altus, Blomberg, Elektra Bregenz, Arctic, Leisure, Flavel and Arstil) has a history of over 40 years in Romania, being one of the most common Romanian brands, 80% of families in Romania having at least an Arctic commodity at home (according to brand site www.arctic.ro). Alongside other "communist" brands, for example Dacia, Gerovital, Borsec, etc. – is one of the brands that adapted and ended successfully the transition from an intensive, centralized production, (in the '80s, more than 80% of Arctic fridge production was intended for export to Western countries, covering over 90% of the domestic fridge market until 1990) to a global brand, adapted to current consumer requirements and needs.

Thanks to the portfolio brands – Arctic and Beko –, the Artic company is a leader on each category of electronic appliances. Arctic has a market share of around 50% for fridges, approximately 34% for washing machines, around 33% for gas cookers and around 18% for in-built commodities, 45% of the Arctic consumers being young who are below 35 years old (according to brand site www.arctic.ro). The campaign to redefine the brand started in 2000, the new brand recovery strategy being sustained by redesigning all identity visual elements – logo, slogan -, the marketing strategy includes differentiation aspects on the appliances market, the Arctic brand being the brand that provided the first and the highest warranty – 3 years – on the Romanian market, and became market leader in 2003. It has also decided the brand reposition by targeting the young consumer (25 – 45 years), especially the young families (according to site www.wall-street.ro).

In 2006-2007, the communication strategy targeted the young consumer, the goal being to revigorate, to grow young and to modernize the image of the Arctic brand. The communication campaigns carried-out under the concept "Believe in you", "Choose to live utterly" and "Inspired from life", were dedicated to young people. These campaigns associated characteristics of young people – buoyancy and vitality – with the new Arctic products, much more performing, modern, in line with the requirements of a dynamic and full of energy life. The three campaigns have earmarked the beginning of a new approach of consumers, aiming to change the Arctic's position as an available appliances supplier to that of a personal development partner (according to site www.wall-street.ro).

Advertising - theoretical considerations

Advertising can be seen as both "art" and "science" (Copley 2004: 101), effective advertising can only be achieved through understanding the subject as a management process. TV advertising is seen as one of the main components of firms' communication strategies, is just one component of an event's integrated marketing communications (Masterman & Wood 2005. p. 134). Compared to other forms of promotion, advertising has so far been a one-way flow of message content, and its effects have been difficult to measure. The major advantage is the low cost per contact and the creative power of advertising means that it can be very cost-effective, especially in consumer markets where there is little between brands other than the ingenuity of the advertising that becomes part of the brand's architecture (Copley 2004, p. 105). In addition, the fragmentation of media means that television advertising is more widely affordable with highly specialized and targeted digital channels (Masterman & Wood 2005, p. 133).

We may conclude that this research work, through using nonparametric tests is imperative for fathoming the results of earlier researches but especially to confirm or infirm these aspects resulted through applying statistic methods, aspects which were used as hypotheses for this research using the advantages of nonparametric inferential statistics. Moreover, as Milton Friedman (1937) stated that there are economical and social data where the normal distribution of these data is an exception, so even more - in our assessment – when we talk about variables which measure preferences aptitudes – as in this research -, qualitative data can be ordered but cannot be always measured quantitative, and ANOVA – the method which Friedman test is most often compared can be limited and inapplicable when the data are measured on different scales.

Therefore, in this paper we used the Friedman test for the first time, followed by the Kolmogorov – Smirnov test, in order to test the advertising preferences of young consumers, to research if the TV advertising carried-out for the Arctic brand respectively, has or has not a positive impact over these consumers. Also, by using the inferential statistic methods preference of young consumers is researched – target of the Arctic brand– for media advertising of the brand compared to that of other global brands, respectively: LG, Whirpool, Orion, Vortex, as long as though Romanian consumers of the durable market are sensitive to price (Gabor & Conţiu 2012), for the first time in post-communist Romania, trade events such as "Black Friday" only took place in 2011 – 22 years after shifting to the market economy-, and only in online trade format, the action being a full success (according to Capital magazine, available on http://www.capital.ro/detalii-articole/stiri/site-ul-emag-a-picat-157056.html), the rough value of orders in the first five hours of trading being four million Euro, the total value of sales being approximately 8 million Euro that day.

2. Data, methodology and sample description

In order to apply these two non-parametric tests it has been used for constituting the sample group, students from "Petru Maior" University, profile "The Economy of Commerce, Tourism and Services " (ECTS), years of study II and III. It has been tested the preferences of these young people referring to advertising clips which have as subject durable goods such as: fridge, gas stove, washing machine, TV sets, DVDs, belonging to the following brands: *Arctic, Beko, LG, Orion, Whirpool, Vortex*, using advertising clips placed on the specialty site www.IQads.ro. These advertising clips have been grouped in four *bars*, thus[61]:

- Seven video clips of Arctic brand, respective: *Arctic 20 programs*[62], *Arctic the fridge, Arctic Oscar, Arctic the TV set, Arctic Umberto, Arctic the bath of the child* and *Arctic the gas stove*;
- Four video clips which had as subjects fridges of different brands, such as: *Arctic the fridge, Arctic Umberto, Beko the surprise* and *Whirlpool Cooling;*

[61] The first, "bar" contains products only from Arctic brand; the following three "bars" contain products from Arctic brand with products from other brands.

[62] The names of the advertising video clips are those from the site www.IQads.ro.

- Seven video clips which promoted washing machines, of different brands, such as: *Arctic 20 programs, Arctic Oscar, Arctic the bath of the child, Beko children, Whirlpool download button, Whirlpool washing, Whirlpool the 6th sense ;*
- Six clips which promoted TV sets and DVDs, of different brands, such as: *Arctic the TV setl, LG Artcool, Orion TV, Vortex DVD, Orion DVD* and *Orion HC.*

The base for the samples started from the distribution of the students registered in the academic year 2016 – 2017, ECTS profile in II and III years of study. Because in the IIIrd year there are no "budgetary" boys, this group will not be presented in the sample in use and, also because there are only two "budgetary" boys in the IInd year, this group will be left outside as well, finally the sample used in study being composed of six groups: group 1 - ECTS II budgetary girls, group 2 - ECTS III budgetary girls, group 3 - ECTS II with tax payment boys, group 4 - ECTS II with tax payment girls, group 5 - ECTS III with tax payment boys, group 6 - ECTS III with tax girls. In the case of applying the K – S test, the 65 students regrouped in two sub-samples, according to characteristic gender, respective a sub-sample formed from 48 girls and another one formed from 17 boys.

The application of the Friedman test has few *particularities*, connected to the statement/formulation of the hypothesis, calculus formula, application conditions, usage modalities, and some other aspects which will be dealt with in this research paper (Gabor, 2012a). Friedman statistics having the following calculus formula, the most often used in practice:

$$S = \frac{12n}{m(m+1)} \sum_{j=1}^{m} \left(\overline{R}_j - \frac{m+1}{2} \right)^2 \quad (1) \quad \text{or} \quad S = \frac{12n}{nm(m+1)} \sum_{j=1}^{m} R_j^2 - 3n(m+1) \quad (2)$$

Friedman test is used when the samples are connected between them – within the present research, the subjects (respective the students) come from the same profile and the same faculty.

The null hypothesis can be formulated in the following way – in the case of our research: H_0 = *there are no significant differences between the sum of the ranks on the column according to treatments* or *there are no significant differences between the sum of the ranks on the columns according to the number of treatments* or *k samples which come from the same population.*

Aspects related to the insurance of the sample representatively can be found in paragraph three, and the results of applying the test for testing the preferences concerning the publicity made for the durable goods traded in Romania can be found at paragraph 4.1.

In this research, the results constituted the base for applying *Kolmogorov – Smirnov test* (K - S) – the latest one giving the possibility of presenting in detail the differences between the subjects' preferences resulted from applying Friedman test, according to different socio-demographic characteristics, the results being presented in next paragraph, respective *the comparison of the preferences order referring to advertising clips for Arctic brand according to the gender of the subject.* The two non-parametric tests were used, thus, in this research, complementary for a better research of the preferences among young people (students) referring to advertising durable goods on Romanian market.

We mention the fact that we have applied K-S test in two of its variants, the case in which the subjects form *a single sample*, case applied for *testing preferences for advertising clips of Arctic brand* and in the second case, *for two pair sub-samples, formed by girls and boys coming from the same population.*

3. Presentation of the research results

In Appendix 1 are presented the scores achieved and the transformation of the scores in ranks. The results (under the shape of medium scores) are presented in Appendix 1, the values from brackets representing the transformations of the medium scores in ranks.

Expressed hypothesis, degrees of freedom, calculated and theoretical values of the Friedman statistics as well as results obtained for every durable of the Arctic brand as well as the other brands comprised in the study are shown structured in table 1 (level of statistical significance taken into consideration is $\alpha = 0.05$).

Table 1. The results for Friedman test hypothesis

	Null hypothesis H_0	Freedom degrees	χ_r^2 calculated	χ_r^2 Theoretical value	Result
Arctic brand	*H_0 = there are no significant differences from a statistic point of view between the groups of students concerning the preference for a certain advertising video clip of Arctic brand.*	6	6.25	12.59	Null hypothesis is accepted.
Product "fridge" of	*H_0 = there are no significant differences from a statistical point of view between the six groups of students concerning the preference for a certain advertising video having as subject fridges of different brands*	3	15.8	7.82	The null hypothesis H_0 is rejected
Product "washing	*H_0 =there are no significant differences from a statistical point of view between the six groups of students concerning the preference for a certain advertising video having as subject the promotion of washing machines of different brands*	6	2.71	12.59	The null hypothesis H_0 it is accepted
Products "TV set" and	*H_0 =there are no significant differences from a statistical point of view between the six groups of students concerning the preference for a certain advertising video having as subject the promotion of the TV sets and DVDs of different brands*	5	14.19	11.07	The null hypothesis H_0 is rejected

The results for Arctic brand indicates *there are no significant differences from a statistical point of view between the six groups of students concerning the preference for a certain advertising video clip of Arctic brand,* and so, all the six groups prefer on the first place, the advertising video *Arctic the fridge*, followed by: *Arctic the TV set, Arctic 20 programs, Arctic the gas stove, Arctic the bath of the child, Arctic Umberto* and, on the last place, *Arctic Oscar.*

For the product "fridge" of different brands, there *are significant differences from a statistical point of view between the six groups of students concerning the preference for a certain advertising video for fridges.* The two groups (group 3 and group 5) which have different preferences are represented by boys from year II and III with tax payment.

For the product "washing machine" of different brands there are no *significant differences from a statistical point of view between the six groups of students concerning the preference for a certain advertising video for washing machines,* and so all the six groups prefer on the first place, the advertising clip *Beko children*, followed by: *Arctic the bath of the child* and *Arctic 20 programs* on the second place, *Whirlpool washing, Whirlpool the sixth sense* and, on the last place at an equal level, *Arctic Oscar* and *Whirlpool download button.*

For the products "TV set" and „DVD" of different brands *there are significant differences from a statistical point of view between the six groups of students concerning the preference for a certain advertising video the promotion of tv sets or DVDs.* The groups which are different in preferences are: the group 1 and the group 3 formed from girls from year II budgetary and boy's year II, tax payment.

As a result of processing the data concerning the preferences for advertising videos of the durable goods brands traded on the Romanian market, by means of non-parametric test destined to test ranks – Friedman test – resulted that, in the case of the videos which were promoting *Arctic* brand, the most preferred clip was *Arctic the fridge.* When this video was watched alongside other

publicity spots which promoted the same domestic appliance – *the fridge, the washing machine and the TV set* - but belonging to other brands, respective *Beko, Whirlpool, Orion, LG* and *Vortex*, the preference for *Arctic* brand was advanced by *Beko* and *LG*, the results being presented in the previous paragraph.

All these aspects from applying Friedman test will be analyzed complementary by means of K-S test, the hypothesis of the statistic analyses being the one that, if we take into account a different student group formation - according to gender – *there are no significant differences referring to preferences already ordered for these advertising videos which promote Arctic brand, according to the gender of the subjects.*

Applying K – S test to the level of the entire sample, one can observe, analyzing the results presented in table 2 (point 1)**,** that only the three advertising videos which have achieved the first three places in the preferences of the students, according to the results of the Friedman test, have significance levels smaller or equal with 0.05 and so only for these videos we take into account the calculated values of the K-S statistics.

Table 2. The results for Friedman test hypothesis

The indicators of the K- S test		Arctic 20 programs	Arctic the fridge	Arctic Oscar	Arctic the TV set	Arctic Umberto	Arctic the bath	Arctic the gas stove
1. For the entire sample, without grouping								
Extreme differences	Absolute	.168	.270	.117	.238	.117	.132	.122
	Positive	.168	.270	.091	.238	.117	.132	.122
	Negative	-.135	-.186	-.117	-.142	-.083	-.076	-.096
K – S statistics		**1.353**	**2.173**	.946	**1.917**	.941	1.065	.985
The significance level		**.051**	**.000**	.332	**.001**	.339	.207	.286
2. For grouping the sample according to gender variable								
Extreme differences	Absolute	.094	.083	.148	.314	.102	.341	.196
	Positive	.094	.001	.148	.055	.045	.341	.196
	Negative	-.043	-.083	-.102	-.314	-.102	-.021	.000
K – S statistics		.334	.295	.525	1.112	.360	1.207	.695
The significance level		1.000	1.000	.945	.169	.999	.108	.720

The theoretical value of statistics K – S is equals, according to formula (4), the paragraph 2.3. with 10.96, and from the table 2 (point 1) one can observe that all the calculated values are smaller than the theoretical value (1.353 for Arctic 20 programs, 2.173 for Arctic the fridge and 1.917 for Arctic the TV set) and as a result it *is accepted the null hypothesis.*

The results of applying K – S test in the case of grouping the subjects of the sample according to *gender* variable are presented in table 3 (point 2), but they are not statistical significant.

In table 7 we detail the results of K – S test after comparing the three products of the Arctic brand with similar products of other brands, for each case, respective: *Arctic the fridge, Arctic the TV set and Arctic 20 programs* (classified on the first three places in the preferences of the students according to Friedman test) and in tables 3 – 6 we present the results conform the SPSS program.

Table 3. The results of K-S test for the entire sample and for grouping the subjects according to the gender variable in the case of the product fridge

The indicators of the K- S test		Arctic the fridge	Arctic Umberto	Beko the surprise	Whirlpool Cooling
1. For the entire sample , without grouping					
Extreme differences	Absolute	.234	.183	.356	.212
	Positive	.234	.183	.356	.212
	Negative	-.176	-.105	-.321	-.128

K – S Statistics		1.883	1.472	2.870	1.710
Significance level		.002	.026	.000	.006
2. For grouping the sample according to gender variable					
Extreme differences	Absolute	.290	.132	.439	.229
	Positive	.290	.053	.439	.229
	Negative	-.245	-.132	.000	-.036
K – S Statistics		1.029	.469	1.554	.812
Significance level		.240	.980	.016	.525

As following we detail the results of the K - S test for the product "*fridge" Arctic* – brand Appendix 2, together with other products of the Arctic brand (point 1.1) and other fridge brands (point 1.2). For significance level $\alpha = 0.05$, the theoretical value of D – in the case of two independent samples ($n_1 = 17$ and $n_2 = 48$) – is 0.3834, from calculus it resulted that the maximum difference between accumulated relative frequencies between the girls and the boys, was 0.084 and because $D_{calculated} < D_{theoretical}$, results that it is accepted the null hypothesis.

For the same theoretical value, the maximum difference between the accumulated relative frequencies for boys and girls, was 0.291 and because $D_{calculated} < D_{theoretical}$, results that the null hypothesis is accepted and so between *the preferences of the boys and the girls referring to advertising videos of the Arctic brand, respective the video Arctic the fridge there are no significant differences from a statistical point of view*. But there differences between the preferences of the boys and the girls (as it has resulted in the case of Friedman test, for the six groups of students) when it is tested the preference for the video *Beko the surprise,* in this case the value calculated being bigger than the theoretical one.

For the case of the durable good "TV set" applying K – S test to the level of the entire sample, it can be observed according to data from table 4 (point 1) that, only for three advertising videos it has been achieved significance levels smaller or equal with 0.05 and so only for these we can take into account the calculated values of K – S statistics, the three videos being actually the video from *the first place I* in order of the preferences according to Friedman test, *LG Artcool,* followed by the videos on places 2 and 3, respective *Orion TV* and *Arctic the TV set.*

Table 4. The results of the K-S test for the entire sample and for grouping the subjects according to gender variable in the case of the product TV set

The indicators of the K-S test		Arctic the TV set	LG Artcool TV	Orion	Vortex DVD	Orion DVD	Orion HC
1.For the entire sample, without grouping							
Extreme differences	Absolute	.192	.269	.215	.147	.098	.156
	Positive	.192	.269	.215	.147	.098	.156
	Negative	-.115	-.231	-.128	-.147	-.096	-.076
K – S Statistics		**1.548**	**2.168**	**1.735**	1.188	.792	1.257
The significance level		**.017**	**.000**	**.005**	.119	.557	.085
2. For the grouping of the sample according to gender variable							
Extreme differences	Absolute	.200	.156	.150	.216	.407	.261
	Positive	.000	.156	.129	.102	.021	.074
	Negative	-.200	-.094	-.150	-.216	-.407	-.261
K – S Statistics		.708	.551	.530	.764	1.442	.925
The significance level		.698	.921	.942	.603	.031	.359

But for all these videos, the calculated values of K- S statistics are smaller than the theoretical value (10.96) and so it is accepted the null hypothesis according to which *there are no significant differences between the subjects of the students sample concerning the preference for advertising videos which have as subject the TV set or DVDs.* In Appendix 2, we present in detail the K – S test for the product "the TV set", Arctic brand (point 2.1.), alongside other products of the Arctic brand and alongside

other brands of TV sets and DVDs brands (point 2.2) starting from the results of the Friedman test .

There are significant differences from a statically point of view for the promotion video of *Orion* brand, respective *Orion DVD*, video which placed itself on the last place in the order of the sample subject's preferences, the calculated value for K-S statistics being bigger than the theoretical value and for a significance level under 0.05.

For the case of the durable good "washing machine" applying K – S test to the level of the entire sample, it can be observed – table 5 (point 1) – that, only for four advertising videos it has been achieved significance levels smaller or equal with 0.1 and so only for these we can take into account the calculated values of K - S statistics, and the four videos being actually the video from the first place I in the order of the preferences according to Friedman test, *Beko children*, followed by the videos from the second place II – with the same score -, respective *Arctic 20 programs* and *Arctic the bath for child* and for the advertising video from the last place in the preferences of the subjects, respective *Whirlpool the download button*.

Table 5. The results of the K-S test for the entire sample and for grouping the subjects according to gender variable for the product washing machines

The indicators of the K- S test		Arctic 20 programs	Arctic Oscar	Arctic the bath	Beko children	Whirlpool the download button	Whirlpool washing	Whirlpool The 6th sense
1. For the entire sample , without grouping								
Extreme differences	Absolute	.152	.102	.160	.262	.160	.107	.143
	Positive	.152	.098	.134	.262	.103	.096	.143
	Negative	-.098	-.102	-.160	-.210	-.160	-.107	-.097
K – S Statistics		1.227	.825	1.292	2.114	1.286	.866	1.151
Significance level		.098	.505	.071	**.000**	.073	.441	.141
2.For grouping the sample according to gender variable								
Extreme differences	Absolute	.150	.124	.369	.255	.358	.168	.145
	Positive	.150	.045	.369	.017	.021	.118	.145
	Negative	-.126	-.124	-.062	-.255	-.358	-.168	-.027
K – S Statistics		.530	.439	1.307	.903	1.268	.595	.512
Significance level		.942	.991	.066	.388	.080	.871	.955

By separating the subjects in two sub-samples according to gender characteristic, the results of the K - S test in the case of the two independent samples for the product "automatic washing machine" of different brands, there have been achieved the results from table 5, point 2 (significance level under 0.1 being recorded only in the case of videos Arctic the bath and Whirlpool the download button, all the other values being statistically insignificant). As follows we detail the K – S test for the product "the washing machine" Arctic brand, alongside other products of the Arctic brand (table 3, point 3.1) and also alongside other washing machine brands – table 3 (point 3.2), based on data resulted after applying Friedman test.

For the significance level $\alpha = 0.05$, the theoretical value of D, in the case of the two independent samples is 0.3834, it resulted from the calculus that the maximum difference between the relative accumulated frequencies for boys and girls was 0.095, and because $D_{calculated} < D_{theoretical}$, results that it is accepted the null hypothesis. In the second case, the maximum difference between the relative accumulated frequencies for boys and girls, was 0.149 and because $D_{calculated} < D_{theoretical}$, it results that it is accepted the null hypothesis. Also, for the video placed on the same level of preference and which belongs to Arctic brand - Arctic the bath of the child - the statistical level is a significant one - $\alpha = 0.07$ - and for the advertising video which is on the last place the order of the preferences - the significance level is significant from a statistical point of view $\alpha = 0.08$ Whirlpool the download button.

Table 6. The results for the K-S test hypothesis

		Null hypothesis H_0	Result
The case of the durable goods "the fridge"	For the *entire sample*, without grouping	*There are no differences between the groups of students for advertising videos which promote the product "fridges" of different brands*	Accepted
	For grouping the sample according to *gender* variable	*There are no significant differences from a statistical point of view between boys and girls.*	Accepted
The case of the durable goods "TV set".	For the *entire sample*, without grouping	*There are no significant differences between the subjects of the students sample concerning the preference for advertising videos which have as subject the TV set or DVDs.*	Accepted
	For grouping the sample according to *gender* variable	*Between the preferences of the boys and the girls referring to advertising videos of the Arctic brand, respective for the video Arctic the TV set, there are no significant differences from a statically point of view*	Accepted
The case of the durable goods "washing machine"	For the *entire sample*, without grouping	*There are no significant differences between the subjects of the students sample concerning the preference for promotion videos which have as subject the automatic washing machines.*	Accepted
	For grouping the sample according to *gender* variable	*Between the preferences of the boys and girls concerning the advertising videos of the Arctic brand, respective for the video Arctic 20 programs, there are no significant differences from a statistical point of view*	Accepted

4. Conclusions and discussions

As a result of applying the non-parametric test for testing the Friedman ranks for analyses the preferences of six groups of student's referring to advertising videos which promote brands of durable goods traded in Romania it has been found out:

- For the advertising videos which have as subject durable goods which belong to the same brand, respective Arctic brand, there are no differences between the preferences of these groups;
- But when it has been tested the preference for Arctic brand alongside other well known brands (Beko, LG, Whirlpool, and Orion) the preferences changed and even more in two of the cases the application of the Friedman test emphasized significant differences in preferences of the six groups.

Friedman statistics, although it has a similar distribution with the one of χ^2 statistics, is applicable only for data measured on an ordinal scale. Even more, it has *the advantage* that, different from χ^2 test, it is not conditioned but the accumulated sum of the application conditions as for the χ^2 test.

For ordinal type marketing data, are applied most often Spearman and Kendall statistics, although the software's dedicated to statistical calculus comprise all the non-parametric tests rank which can be used both for nominal data as well as for ordinal data offering the advantage of a better statistical decision and for marketing management.

The Friedman test has a great applicability for marketing data because quite often, in market studies, the consumers are requested to order preferences, opinions, attitudes etc. (the most often encountered marketing data being the ordinal and the nominal ones), and the test being another statistical tool which can help in taking a marketing decision.

As a result of applying non-parametric test for testing K – S ranks to compare the order of the students' preferences concerning advertising videos which promote durable goods produced by Arctic company it has been found out that:

- For the advertising videos which had as subject durable goods which belong to the same brand, respective Arctic brand, there are no differences between the preferences of these groups, thus being confirmed the results of the Friedman test which represented the basis for this study.
- When it has been confirmed the preference for Arctic brand alongside other well known brands (Beko, LG, Whirlpool, Orion) the results of the K – S test infirmed the ones of the Friedman test**.** Practical, actual, this aspect has been observed in the case of the product "fridge" for which advertising video place on the first place in the preferences of the students there are no significant differences between the subjects according to gender variable (because the Friedman test lead to different results referring to this hypothesis, it's possible that another demographic variable to make the difference between preferences). There are the same results in the case of the other products, respective "TV set" and "washing machine".

We consider the results of this research as being important because, in the current global durable goods market, the primary role of advertising is to help build brands (Copley 2004:110). Producers and distributors have to adapt their offer to the particularities of the Romanian market. One of the statistics tools, the Friedman test was used for the first time in testing the TV advertising preferences, as it is more often applied in medical domain and learning machine.

The follower of the „perfect society", J. K. Galbraih mentions that (1996, p. 21), *consumer sovereignty is one of the most common and shared ideas of an orthodox economy*, singularizing with direct reference to endowment with durables, *poverty and inflexible way that communist countries were supplying their citizens with such commodities compared to advertising, their diversity and abundance in capitalist countries influenced the collapse of these systems more than it is thought.*

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Appendix 1

STUDENT GROUP	1. ARCTIC BRAND						2. THE PRODUCT FRIDGES				
	Arctic 20 programs	Arctic the fridge	Arctic Oscar	Arctic The TV set	Arctic Umberto	Arctic the bath	Arctic The gas stove	Arctic The fridge	Arctic Umberto	Beko The surprise	Whirpool Cooling
Group 1	5 (4)	2 (1)	8 (7)	3 (2)	7 (6)	4 (3)	5 (5)	2 (2)	7 (4)	2 (1)	7 (3)
Group 2	3 (1)	5 (5)	6 (6)	4 (4)	5 (5)	3 (2)	4 (3)	4 (2)	5 (4)	1 (1)	4 (3)
Group 3	4 (3)	2 (1)	8 (7)	3 (2)	5 (4)	6 (6)	6 (5)	3 (2)	6 (3)	2 (1)	6 (4)
Group 4	3 (2)	2 (1)	7 (7)	4 (3)	6 (6)	5 (4)	5 (5)	3 (2)	6 (4)	1 (1)	4 (3)
Group 5	4 (2)	3 (3)	5 (4)	3 (1)	6 (5)	5 (4)	5 (4)	5 (3)	5 (4)	4 (1)	4 (2)
Group 6	5 (4)	2 (1)	6 (6)	4 (3)	5 (5)	7 (7)	4 (2)	3 (2)	5 (4)	1 (1)	4 (3)
∑ R	**16**	**12**	**37**	**15**	**31**	**26**	**24**	**13**	**23**	**6**	**18**

STUDENT GROUP	3. THE PRODUCT WASHING MACHINES							4. THE PRODUCTS TV SETS AND DVDS					
	Arctic 20 programs	Arctic Oscar	Arctic the bath	Beko children	Whirpool the button	Whirpool washing	Whirpool 6 th sense	Arctic the TV set	LG Artcool	Orion TV	Vortex DVD	Orion DVD	Orion HC
Group 1	4(3)	6(4)	4(2)	3(1)	9(7)	6(6)	6(5)	5(4)	4(3)	3(1)	7(6)	6(5)	3(2)
Group 2	3(1)	7(6)	3(1)	4(3)	7(5)	4(2)	5(4)	4(3)	3(1)	3(2)	6(5)	7(6)	6(4)
Group 3	4(2)	7(6)	5(3)	2(1)	6(5)	5(4)	6(5)	3(1)	3(3)	3(2)	7(6)	5(5)	3(4)
Group 4	4(3)	7(6)	4(2)	2(1)	6(5)	6(5)	5(4)	3(3)	2(1)	3(2)	7(5)	7(6)	3(4)
Group 5	4(3)	5(6)	6(7)	3(1)	5(5)	4(2)	5(4)	4(2)	3(1)	4(3)	5(4)	5(5)	4(2)
Group 6	5(5)	6(6)	4(2)	3(1)	7(7)	5(4)	5(3)	3(2)	3(1)	5(3)	6(5)	7(6)	5(4)
∑ R	**17**	**34**	**17**	**8**	**34**	**23**	**25**	**15**	**10**	**13**	**31**	**33**	**20**

(**Note:** The data from the above table have been achieved on the basis of calculus starting from the data gathered from each student and then centralized to the level of each group of students, using descriptive statistics, respective medium scores calculated by means of weighted arithmetic.)

Appendix 2

The place	*Arctic the fridge watched alongside other videos of the Arctic brand*			*Arctic fridge* watched alongside other videos of the *Beko and Whirlpool brands*			*Arctic the TV set watched alongside* other videos of the *Arctic brand*		
	Cumulative frequencies Feminine (F_1)	Cumulative frequencies Masculine (F_2)	Differences $F_1 - F_2$	Cumulative frequencies Feminine (F_1)	Cumulative frequencies Masculine (F_2)	Differences $F_1 - F_2$	Cumulative frequencies Feminine (F_1)	Cumulative frequencies Masculine (F_2)	Differences $F_1 - F_2$
Place 1	0.353	0.352	0.001	0.411	0.167	0.244	0.294	0.104	0.190
Place 2	0.603	0.646	0.043	0.587	0.520	0.067	0.647	0.333	**0.314**
Place 3	0.686	0.705	0.019	0.646	0.687	0.041	0.765	0.583	0.182
Place 4	0.749	0.764	0.015	0.646	0.812	0.166	0.824	0.687	0.137
Place 5	0.874	0.882	0.008	0.646	0.937	**0.291**	0.824	0.750	0.074
Place 6	0.916	1.000	**0.084**	0.705	0.937	0.232	0.883	0.833	0.050
Place 7	0.958	1.000	0.042	0.823	0.979	0.156	0.883	0.916	0.033
Place 8	1.000	1.000	0.000	-	-	-	0.883	0.937	0.054
Place 9	-	-	-	0.882	0.979	0.097	0.942	0.958	0.016
Place 10	-	-	-	1.000	1.000	0.000	1.000	1.000	0.000

Continuation

The place	*Arctic the TV set* watched alongside other videos belonging *LG, Orion* and *Vortex brands*			*Arctic 20 programs* watched alongside other videos of the *Arctic* brand			*Arctic 20 programs* watched alongside other videos of the *Beko* şi *Whirlpool* brands		
	Cumulative frequencies Feminine (F_1)	Cumulative frequencies Masculine (F_2)	Differences $F_1 - F_2$	Cumulative frequencies Feminine (F_1)	Cumulative frequencies Masculine (F_2)	Differences $F_1 - F_2$	Cumulative frequencies Feminine (F_1)	Cumulative frequencies Masculine (F_2)	Differences $F_1 - F_2$
Place 1	0.176	0.083	0.093	0.176	0.271	**0.095**	0.059	0.208	**0.149**
Place 2	0.471	0.271	**0.200**	0.352	0.396	0.044	0.411	0.312	0.099
Place 3	0.706	0.521	0.185	0.528	0.521	0.007	0.470	0.416	0.054
Place 4	0.765	0.728	0.037	0.646	0.604	0.042	0.646	0.520	0.126
Place 5	0.941	0.832	0.109	0.705	0.667	0.038	0.705	0.666	0.039
Place 6	0.941	0.895	0.046	0.705	0.792	0.087	0.764	0.791	0.027
Place 7	-	-	-	0.823	0.917	0.094	0.882	0.895	0.013
Place 8	1.000	0.916	0.084	0.941	0.917	0.024	1.000	0.937	0.063
Place 9	1.000	0.937	0.063	0.941	0.959	0.018	1.000	0.979	0.021
Place 10	1.000	1.000	0.000	1.000	1.000	0.001	1.000	1.000	0.000