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Romanian Young Consumers Perception of Car Brands: A Personal Construct Theory Approach

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Abstract

Owning a "renown" car brand, a "latest hour" model, with a futuristic design, etc. is the ultimate dream of any driver. Thus, the car producers always take into account the real or the ideal needs of consumers, including on the emergent market. The research of car brand perception among consumers is possible with quantitative and qualitative methods statistics, respectively. The combine use of these leads to the qualitative improvement of the research, in the sense that it fathoms the aspects belonging to endogenous and exogenous variables, direct noticeable, of the consumers. This research regarding the perception of the car brands most often encountered on Romanian highways, among young Romanian consumers is based on a combined use of a repertory grid and the Principal Component Analysis method for the data elaborating and construing phase. The results show: the perceptions of consumers are grouped in: the ideal image of the future, youth – sportivity, reliability; a strong perception of the symbolic significance, subjective related to car brands; good perceptions according to the history of the car brands; good perceptions according to aspects connected to reliability and maintenance of the car brands; good perceptions according to the design of the body car and aspects connected to it.

Keywords: *Repertory grid, Kelly's personal construct theory (PCT), principal component analysis (PCA), car brands, perceptions, Romanian young consumer*

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1. Introduction

The consumers of the auto market have particularities which take into account quantitative, measurable, socio-demographic characteristics as well as qualitative characteristics (perception, ideals, subjectivism, previous experiences, future intentions), more difficult to measure but which have a major importance for the, auto market "actors" (Gabor, 2012a). The acquisition process, besides the characteristics of the acquisition of long term use goods has also particular characteristics, in the sense that, the ownership and driving of a car satisfy different needs: for a public person it can be a message about themselves towards exterior, for persons with high income the motivation and the choice of a car will be different from the one with an average income, for a young consumer some characteristics are important, for an old person one totally different ones, etc. The ownership itself is also identified with the perception - intrinsically and extrinsically – about its owner.

The global auto market is disputed by historical brands or new ones (Asiatic ones as an example) which develop politics and marketing strategies supported by innovations – technical, economical, technological, etc. -, by aggressive advertising campaigns using promotional supports, the most expensive ones, attending famous auto saloons, articles in newspaper or TV shows especially dedicated to this mark.

In the 21th century, owning a car has no any connotations connected to the persons or goods mobility, but to the "personality" of the owner, "his image" and the perception among the others.

In Romania, the auto market is characterized by certain *particularities*:

- The consumers cover a large area: from owners of unique models of exquisite luxury brand cars to consumers who purchase second-hand cars or those who still drive the historical Romanian car brand *Dacia*;

- The Romanian consumer prefers German car brands (Volkswagen[1] and Opel - according to The Direction of Registering and Driving License Regime of the Vehicles (DRPCIV) – concerning the acquisition of new cars and second-hand, in the detriment of other car brands, different from Czechs, Hungarians, Poles and Slovaks who prefer second-hand cars manufactured in their own country (according to a study made by AAA Auto[2], one of the biggest second-hand car dealers from Central Europe);

[1]The imports of the *Volkswagen* car brand recorded a 19.9% increase on the first five months of 2011, placed at a short distance is the other car brand from the auto group *Skoda*, with an increase of 14%, *Renault* being on the third place in a drastically drop with 25.9%, in comparison to 2010. The other car brands are: *Ford* (- 46%), *Opel* (- 4,4%), *Hyundai* (-43.3%), *Chevrolet* (- 30.7%), *Peugeot* (+2.6%), *Toyota* (- 10.5%) and *Suzuki* (+ 8.3%) (according to APIA).

[2] In Czech Republic, Skoda controls 37% of the second-hand car market and in Slovakia 36%; *Suzuki* has a market share over the average in Hungary, in Poland, Opel is perceived as being a local brand and it has an important market share.

- Concerning the acquisition of second – hand cars (market which, in January 2011 lost 30% in comparison with January 2010, according to the site www.auto.ro) counteracting measures have been taken. In Romania a subvention programme, "The REMAT Ticket"/"Buy-Back"is in progress which aims to withdraw from the circuit polluting old cars of the Romanian car brand Dacia through granting vouchers programme for acquiring a new car, regardless of the car brand (there are many other brands how applied this programme, i.e. Ford, Toyota and Renault).

The perception of the consumers towards the car brand is an important aspect of the marketing mix of the car market, "actors" with major implications in conceiving the promoting and communication policies and strategies with repercussions on the car brands marketing budget and finally on the car price.

Conducting a research concerning the car brand perception among consumers is possible with qualitative, statistics and quantitative methods, the combined use of these gives the possibility of a qualitative increase of the research, in the sense that it fathoms aspects of endogenous and exogenous variables, directly observable of the consumers. We decided to use in this research, for a combined use of Kelly repertory grid, in eliciting phase of car brands construction and the data collecting phase and principal component analyses (PCA) for the elaboration data phase and interpreting them, using as well descriptive statistics for a better internal interpretation of the research results. After the basic description, to investigate the relationships between elements, and between constructions, in the grid Jankowicz (2004) and also Pargtington (2002: 211 – 213) recommend PCA.

The Kelly personal construct theory considers that every person uses concepts that are individual to perceive the outwards and that drives its behavior and that, also, helps explain the behavior of other people. The development of this theory as a measuring tool in psychology has gained its position at the same time with the complex statistical methods and computer related applications have become increasingly used. It has been used in order to convert the „fuzzy" areas (blurred) of behavior in statistics (Jerrard, 1998). Therefore it uses "*elements*", by "*constructions*" and *relations* that join elements to constructions and does have important implications for economic decision-making because every decision produces cognitive dissonance in individuals (Lester & Yang, 2009).

The objectives (and in fact the hypothesis of the research) of this research are that the perceptions of the young consumer regarding car brands will be grouped into in the following way:

- *to the car brand origin*
- *to the history of the car brands*
- *to the design of the body car*
- *to aspects connected to reliability*
- *to aspects connected to maintenance*
- *according to symbolic significance*

A graphical abstract of this research can be seen in the Figure 1.

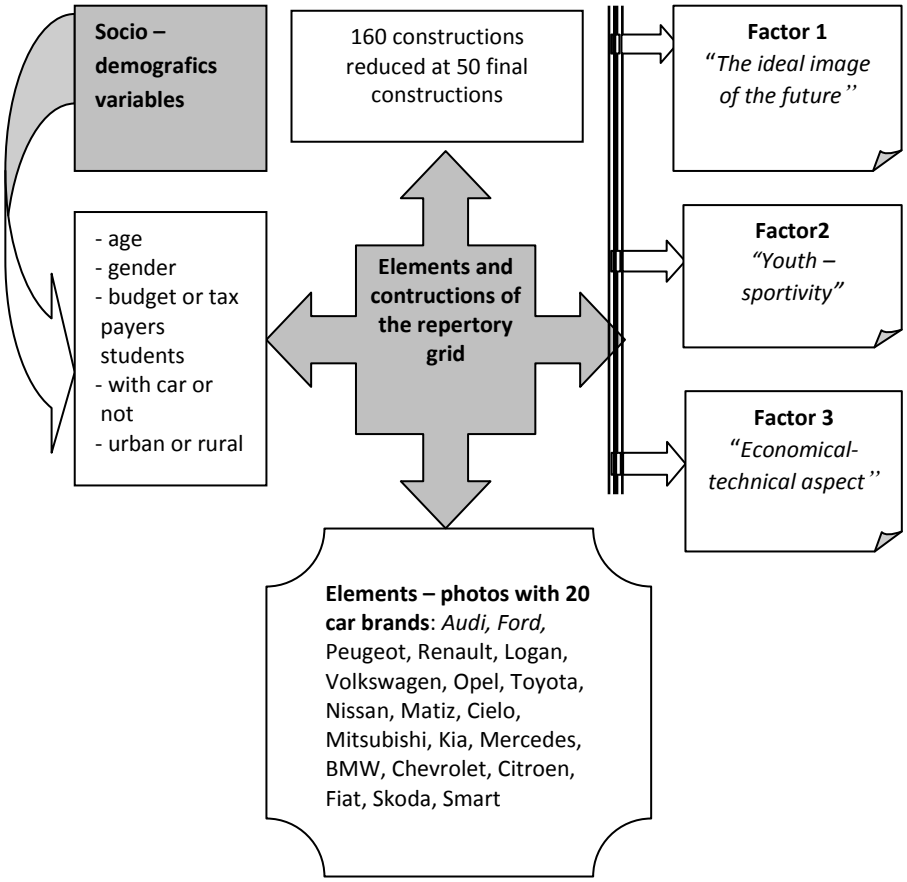

Figure 1. Graphical abstract of the research

2. Methodology

The sample used within this study consisted of 25 students (as in the foreign literature are the most common type of individuals use) from „Commerce and Tourism Economy" specialization, Romanian university, the 2nd and 3rd year of study (Figure 2), being identified convergence link between Kelly's theory and education (Latta & Swigger, 1992, Hunter & Beck, 1996, Plank & Green, 1996, Buckenham, 1998, Hunter & Beck, 2000, Coshall, 2000, Caldwell & Coshall, 2002, Lawton, 2005). In the international literature review, the recommended number of the sample is between 12 and 40 respondents, according to Evrard, Pras, and Roux (2003: 156).

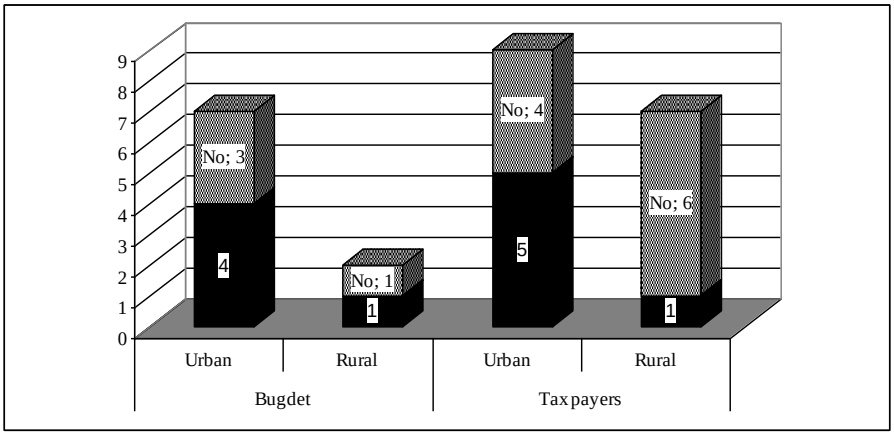

Figure 2. The structure of the representative sample group according to their background, owning or not owning a car and budget students or tax payers

The elements of the study were represented by a set of 20 images (Burke 2001: 76-92, Coshall 2000, Gabor 2012b, Gabor 2014) selected by full repertory grid method (Fransella et al., 2004: 27, Edwards et al., 2009) based on discussions with students (Gabor 2012b, Gabor 2014). We believe that students (and generally people with an average education level at least) have a more complex vocabulary and are able to better reproduce in their own words their perceptions. Using students in the sample, the main disadvantage of using the Kelly grid has been removed (Mitchell &Kirall, 1999) of limiting their mental and imaginative capabilities of subjects to verbally reflect their experiences in qualitative idiosyncratic terms.

The steps taken to implement the repertory grid are combinations found in the literature (Coshall, 2000, Siau & Wang, 2007, Edwards et al., 2009). In eliciting of constructs process, we used triads of elements (Botterill & Crompton, 1996, Coshall, 2000, Caldwell & Coshall, 2002, Fransella et al., 2004: 27, Fransella, 2005:47), being considered more effective, participants completing the grid independently (Edwards et al., 2009). For the valuation of the repertory grid we used Osgood scale in five steps. To complete the grid Kelly we opted for the rating method (Botterill & Crompton, 1996, Lawton, 2005, Gabor 2012b, Gabor 2014). Repertory grid has the advantage that minimizes distortion caused by the researcher because it forces the subjects to respond on a predetermined scale but allow them to provide their own elements and/or constructions (Lawton, 2005).

For the constructions extraction we have chosen group elicitation (Edwards et al. 2009) because it has the advantage that allows participants to see the individual interpretations of others (Tun & Hunter, 2002) being extracted a total of 160 constructs. We used the constructions extraction through full repertory grid, so the

individual identifies both the elements and constructs, and these are more likely to be personally meaningful to participants. Even more, the elicited constructs are more likely to generate extreme ratings than supplied constructs, perhaps because the elicited construct is more meaningful and therefore more subject to intensity of feeling.

In the present work, the elements are constituted by 20 colored photos of the most common car brands, these being established as a result of consulting statistics published by APIA: *Audi, Ford, Peugeot, Renault, Logan, Volkswagen, Opel, Toyota, Nissan, Matiz, Cielo, Mitsubishi, Kia, Mercedes, BMW, Chevrolet, Citroen, Fiat, Skoda and Smart.* The constructions generated were 160 in number, finally they were reduced to 50 (table 1) – through group formation, these being those which formed repertory grid used for collecting data research. In the other research (Fransella, 2005: 47), in a grid about cars, the elements was different type of car. Regarding the number of elements, Jankowicz (2004:73) recommended at least six elements, and also considers that a number of 50 elements is excessively (Jankowicz, 2004).

From the three possibilities of "connection" of construction elements - dichotomy, ranks and rating – we've chosen rating due to the fact that it produces a better discrimination than dichotomy and it has many advantages (Jerrard, 1998): the use of scatter plot as graphic, shows connections between constructions determined through relative numeric position of the elements on the construction dimensions, the ease of using elaboration statistics soft. We used a five step scale. (Fransella, Bell & Bannister, 2005: 59), the advantage being that *between them, the elements, constructs, and ratings of elements on constructs provide you with a kind of mental map: a precise statement of the way in which the individual thinks of, gives meaning to, construes, the topic in question* (Jankowicz, 2004: 14), an aspect recommended by Goffin (Partington, 2002: 200). For constructions eliciting we opted for a combined use of the two variants - personal or provided by the researcher according to Goffin (Partington, 2002: 205 – 206) following the certain phases (Siau & Wang, 2007)**:**

1. There have been selected the elements, being generated 160 constructions;

2. The assessment of each element of each constructions, having as objective if the extracted triads or constructions do not repeat;

3. Applying statistical methods of arrangements constructions in groups to create a focus grid. Thus from 160 constructions generated have been kept for the next phase only 50 (Table 1), some of them being obtained through arranging other pairs of attributes. There have been kept the attributes, which are connected with observable characteristics from photographs and the exterior of the car or general characteristic of the car brand. For this phase, it was distributed to each subject a set of 20 photos of cars and a grid. The completion of each grid took 90 minutes, the technique being time-consuming, typically 60 minutes (Partington, 2002).

Table 1. The 50 constructions remained in study

1. The rims are from aluminum and with a particularized design – rims are from sheet metal with a simple design / standard.	*27. Environmentally friendly engine – polluting engine*
2. Three car door model - five car door model	*28. Two seats habitacle - four/five seats habitacle*
3. German engines - other engines from different countries	*29. For family going outs or weekend – for going to work.*
4. Big trunk – small trunk	*30. Preponderantly bought by persons with high income or VIP – bought by persons with medium income.*
5. Low ground clearance – high ground clearance	*31.A car for Romanian roads – a car for foreign roads*
6. "Sport" model - "city" model	*32. Expensive car maintenance - acceptable / cheap technical maintenance*
7. With signal light mirror - without signal light mirror	*33. A car brand very often met on Romanian highways – a car rarely encountered on Romanian highways*
8. Metalized color- dimmer color	*34. Big exterior size– small exterior size*
9. A special headlight design – "standardized" headlights design	*35. Historical car brands – contemporary "new", "recent" car brands.*
10. "Feminine" - "masculine"	*36. Sport class – business class*
11. Big habitacle – Small habitacle	*37. A model for young people – a model for old people*
12. Big space necessary for parking – small space necessary for parking	*38. Inspires "power"- inspires "simplicity"*
13. Envelopes with a big diameter – envelopes with a small diameter	*39. Limited edition – mass production*
14. With supplementary trunk – without supplementary trunk	*40.High autonomy consumption- low autonomy consumption*
15. With turret – without turret	*41. "Aggressive" design – "nice" design*
16. European brand car – Asian car brand	*42. With tailgate door – without tailgate door*
17. Speed >200 Km/h - speed <200 km/h	*43. With aileron– without aileron*
18. "Futuristic" car body design – "classic car" body design	*44. Big axle base – small axle base*
19. Low fuel consumption – high fuel consumption	*45. A big width of the car - a small width of the car*
20. 4 x 4 traction - 4 x 2 traction	*46. Aerodynamic design - non - aerodynamic design*
21. Expensive car – acceptable price car	*47. High visibility - low visibility*
22. "Retro" design - „actual" design	*48. A big raw mass of the car -a small raw mass of the car*
23. High stability – low stability	*49. Sport tyres - standard tyres*
24. Ergonomic habitacle – "uncomfortable" habitacle	*50. High quality body car – low quality body car*
25. CASCO insurances, mandatory and cheap/acceptable - expensive insurances	
26. With the latest technical equipment – without the latest technical equipment	

For factoring the formed variables from constructions, it was used the principal component analysis (PCA) method with Varimax rotation being recommended by Fransella, Bell and Bannister (2005: 86) also met at Jankowicz (2004: 73) the author specifying the condition of applying the method (2004: 94), which means minimum six elements and six constructions.

PCA is one of the descriptive data analysis methods that are applied quite often for

quantitative data and mostly used to process data gathered by means of the Kelly grid (Coshall, 2000). For inside interpretations we used descriptive statistics, absolute frequencies respectively (Edwards et al., 2009), relative frequencies and average scores calculated by means of weighted arithmetic mean and SPSS 16.0 (Lawton, 2005) and Excel were used for data processing.

3. Results

Analyzing the matrix of the 50 constructions, it has been found out that there negative correlations as well as positive, thus, constructions such as "*feminine – masculine"* are negatively correlated with those connected with the exterior dimensions of the car or the space necessary to park the car, as well as a special design of the headlights, big sized tires, latest technical gadgets, a special design of the rims and the material they are made of or a body car futuristic design is not suitable for the Romanian highways; the 100 km medium consumption is negatively correlated with attributes such as: aggressive or nice design, the cost of the car maintenance or its road stability; if the car is used on Romanian roads then its maintenance is very expensive and these kind of cars are usually used by old couples, a car needs a high quality body car.

Concerning *positive correlations*: persons with high income buy models dedicated to young people, which means more and more expensive, sport, with sport tires and not standard, which inspire power and have an aggressive design, the latest rims connected to the latest car technical gadgets and equipment; that five car doors models are for old people; that a big tire diameter is associated with car stability, with its "price", with an aggressive design which inspires power, aggressively; the space necessary for parking the car is directly correlated with exterior dimension of the car, with its width and the raw mass of the car.

Taking into account that the representative sample group used in research was constituted from subjects with the age comprised between 20 and 22 years, who don't have their own income, didn't have a family of their own and they are not the head of the family, so subjects for whom economical aspects are not a decisive criterion and who have no value system specific to the age, this aspect being very well emphasized, from a statistic point of view determined by negative and positive correlations which "connects" variables which depend on "personal" aspects, based on the personal experiences and perceptions of each subject. In this way "constructions" such as "*feminine"* – "*masculine", inspire "power"* and *"simplicity" a model for young people - a model for old people"* etc. are most often met in significant correlations and not attributes which relates to economic –technical or simply economical characteristics.

After the first applying of PCA over 50 constructions (see table 1) it has been found out that there are variables which either offer redundant information or don't emphasize anything statistic, and thus it has been decided their elimination and reapplying PCA, the decision was made by analyzing the correlation coefficients

from correlations matrix and eliminate those constructions who have no significant or intensive correlations. In the case of the first apply, 11 principal components resulted which explained 64.43% from total variance. Because the main goal of PCA is to reduce the number of variances, we have applied PCA three times and finally we decided for all 19 remained "constructions". It has been observed that, although 31 constructions were eliminated, those between there were significant correlations remain those, which are connected with subjectivity, perception, and personal experience*, respective variables of the type, which inspires "power" – inspires "simplicity", "aggressive" design – "nice" design, a model for young people – a model for old people, with latest hour technical equipment – without technical equipment etc.*

We have applied the PCA method to visualize, in factorial space, the group formation of 20 *elements* related to the 19 final *constructions*, respective the possibility of identifying through what kind of subjective and perceptual attributes is characterized respectively, and through what differ the car brands used in research, respectively. Through applying PCA, it has been also aimed the hypothesis testing, according to which the car brands will be grouped according to; the origin of the car brand (European, American and Asian); car brand history; the design of the body car and different aspects connected to it; the reliability of the car; car maintenance; the subjective and symbolic significance.

From the second chart one can observe that, we can keep in our mind *three principal components* (**PC**), the 20 elements will be represented on three factorial axes formed by the combination of the construction, respectively because only for three components eigenvalues bigger than 1 have been obtained which together explain 63.09% from the total variance of the points cloud (Figure 3 and table 2).

The values of the correlation coefficients serve as coordinates of the constructions in factorial plan of the three PCs.

Also the results of KMO test (the value is equal with 0.946 and is more than 0.5) and Bartlett's test of Sphericity (see the results in Table 3) indicate that all the 19 constructions are not correlated within the surveyed population.

Table 2. Total variance explained and the values for 19 final constructions

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.798	46.303	46.303	8.798	46.303	46.303
2	1.922	10.117	56.420	1.922	10.117	56.420
3	1.266	6.665	63.086	1.266	6.665	**63.086**
4	.853	4.487	67.573			
……	…..	…..	…..			
19	.155	.814	100.000			

Extraction Method: Principal Component Analysis

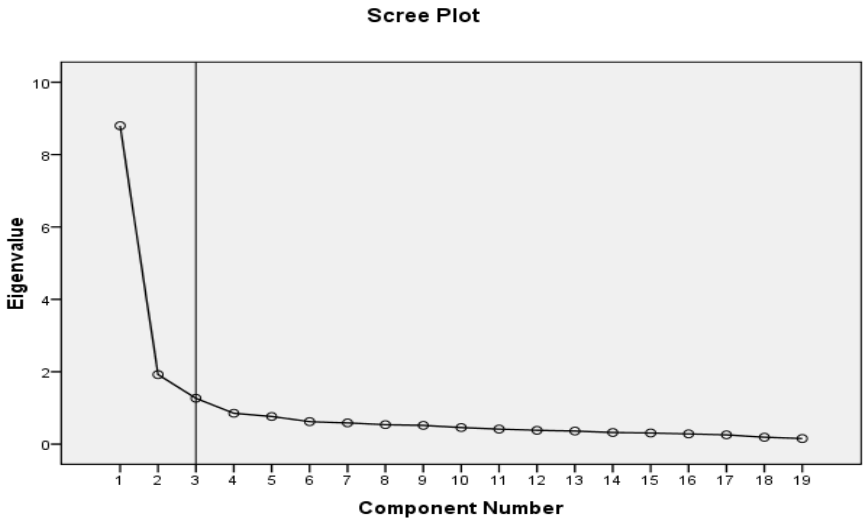

Figure 3. Scree plot

Table 3. KMO and Bartlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.946
Bartlett's Test of Sphericity	Approx. Chi-Square	5752.103
	Df	171
	Sig.	.000

Analyzing the results from Table 4 (1 - 3 columns)**,** as well as the contributions coordinates of the statistic units and the variables on the factors axes, results:

- *The first principal component* (**PC1**) is close to attributes which depend on self imagine reflection of the subject and what he wishes to "communicate" to exterior by owning a certain type of car, all the people "dream" to an ideal image of the self, what they want to own in the future, respectively a car with latest technical equipment, aerodynamic design, "futuristic" design and a very good quality, resistant to impact , an expensive car associated - in the ideal image of the subjects - with the future welfare the young aspire to.**PC1** is correlated negatively with an attribute which is connected to "reality", opposed to other attributes "idealistic": the car has to be suitable for driving on Romanian highways with all their "particularities" but with another attribute which is related to image, respectively retro design or contemporary design of the car. We can thus name PC1 "***the ideal image of the future"***

- *The second principal component* (**PC2**) is a complete particularization (in detail) of a sports model car, respectively: two seats habitacle, sport class, a model for young people, bought mainly by persons with high income or VIPs, sport tyres and

an "aggressive design". These constructions which describe PC2 contain a variable which is negatively correlated with this; the fact that these sport models are rarely met on the Romanian roads and so we can call it "***youth – sportivity***"

- *The third principal component* (**PC3**) contains constructions which are related to economical - technical aspects: big exterior size and implicitly a greater stability, the big size of the car inspires "power2 and obviously requires big maintenance costs. In **PC3** composition there is also a construction which is positioned in a negative plan; respective the high fuel consumption which is correlated in the opposite way with the other aspects of the car; which is called "***reliability"*** or "***economical - technical aspect***".

Table 4. The principal components matrix resulted from Varimax rotation and the matrix of the scores coefficients for the three principal components

The constructions	The principal components matrix resulted from Varimax rotation			The matrix of the scores coefficients for the three principal components		
	PC1	PC 2	PC 3	PC 1	PC 2	PC 3
With the latest technical equipment - without the latest technical equipment	.745			.242	-.111	-.029
Aerodynamic design –non-aerodynamic design	.723			.269	-.178	-.010
Retro design – modern design	-.686			-.369	.157	.246
"Futuristic" car body design - "classic" car body design	.644			.159	.021	-.067
High quality body car – low quality body car	.622			.196	-.083	-.024
A car for Romanian roads - a car for foreign roads	-.617			-.195	.003	.121
An expensive car – an acceptable car price	.529			.038	.041	.097
Two place habitacle - four/five place habitacle		.788		-.098	.290	-.064
Sport class – business class		.722		-.096	.262	-.039
A model for young people - a model for old people		.691		.044	.191	-.127
A car brand very often met on Romanian highways- a car brand rarely met on Romanian highways		-.637		.196	-.304	.021
Preponderantly bought by persons with high incomes or VIP – bought by persons with medium incomes		.572		-.004	.106	.091
Sport tyres – standard tyres		.536		.007	.104	.055
"Aggressive" design- "nice" design		.492		.000	.075	.111
Big exterior size– small exterior size			.762	-.101	-.168	.397
Low stability - high stability			.717	.030	-.116	.259
Low fuel consumption - high fuel consumption			-.691	.202	-.062	-.330
Inspires "power" - inspires "simplicity"			.524	.012	.062	.120
Expensive technical maintenance - cheap technical maintenance			.498	-.010	.070	.125

In order to represent individuals points, respectively the 20 elements, on the *individuals map* we use their coordinates placed in the three PC*,* through the calculation of the rated proper vectors of the correlations matrix. In table 4 it can be observed the group formation of the 19 constructions on the three PCs. The three PCs are "abstract" and to make the internal interpretation of the components it is needed the calculation of the correlation coefficients between initial variables of the research and the three PCs ,results emphasized in table 4 (columns 4 - 6) and from which results:

• The constructions which form **PC1** maintain the sense of the correlation (*retro design , contemporary design , a car for Romanian roads – a car for foreign roads* these are negatively correlated with PC1 while the constructions which support the ideal image of the future maintain a positive correlation with cu **PC1**;

• The constructions which form **PC2** have a particularity meaning that, they are positively correlated with **PC2** and negatively with **PC1** and **PC3** respective if in present – due to fact that the subjects are young -, they want cars which show sportivity and youth, in the future they don't perceive this image for the time when they will become family, they will be hired or they will have their own income. This aspect is also supported by the fact that the construction of a car brand often met on the Romanian roads - a car brand seldom met on the Romanian roads which contributes to the formation of **PC2** is negatively correlated with this and positively correlated with **PC3** and **PC1**;

• The constructions which form **PC3** contain aspects which support the hypothesis of the research, respectively, in the future when the actual subjects will be hired or will earn their own incomes they perceive as a future car a car without big dimensions, easy to park and which has a low cost maintenance, aspect negatively correlated with **PC1**. Concerning the connection of the constructions which compose **PC3** with **PC2**, exterior dimension, stability and medium fuel consumption at 100 km are correlated negatively with **PC2**.

In order to analyze the positioning in three-dimensional space of the three PCs for the 20 elements, the descriptive statistics indicators have been applied, on their basis being emphasized the affiliation or not, of each car brand in the space of the three PCs and especially if the initial hypothesis of the study are confirmed or not. Also for a better visualization of the "localization" of the 20 elements towards the factorial axes it has been decided to use their representation in a bidimensional space, grouping the three **PCs** two by two, the three graphical representations being present in Figures 4 - 6.

Analyzing Figure 4[3], it has been found out that:

[3]There is in the graphic representation from Figure 3 a car brand which localization wasn't unanimous for one of the four quadrants, respectively*Skoda* the explanation being that, although it is a German car brand, the perception is still connected to the Czech origin of the car brand.

- In the positive space formed by **PC1** and **PC2**, respective quadrant 1, we can find the following car brands *Logan, Cielo, Matiz, Chevrolet* which means predominant Asian car brands, with the exception of car brand *Logan* which justification for its place is owed to the accessible prices for mandatory insurances and those of CASCO type and for the fact that it is a car specially created for Romanian roads.

- French brands, *Citroen, Peugeot, and Renault* are grouped in quadrant 2 being perceived as sportive, very often met on the Romanian roads.

- Quadrant 3 is occupied by car brands such as *Smart, Kia, and Mitsubishi*, rarely met on Romanian highways, perceived as future cars ,with the latest full option technology, with a futurist car body design, expensive;

Quadrant 4 is destined for in exclusivity with few exceptions (*Volkswagen & Opel*) to German car brands: *Mercedes, Audi, Opel and BMW*.

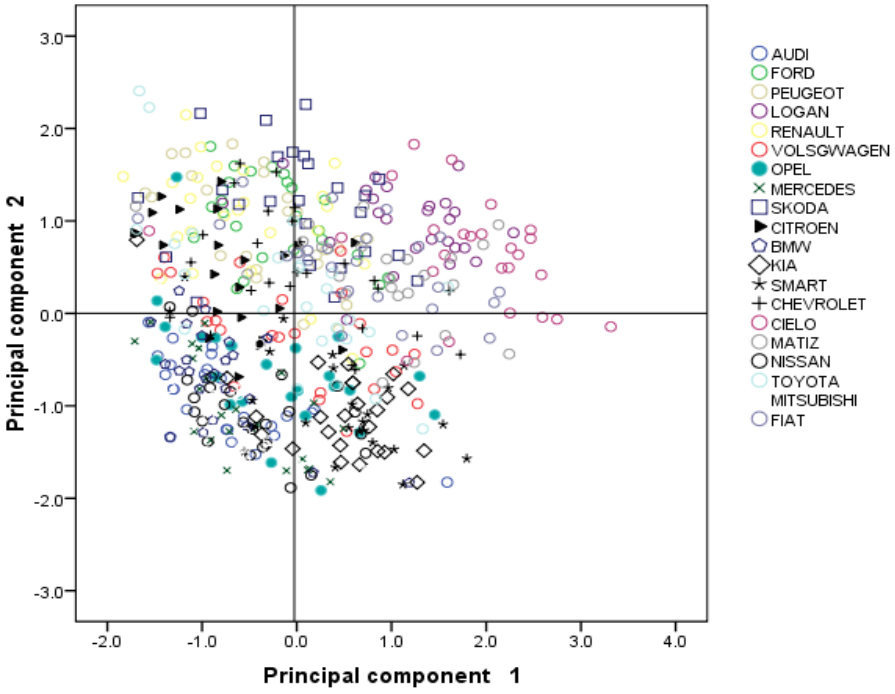

Figure 4. The map of the elements in bidimensional space PC1 and PC2

Analyzing graphic representation from Figure 5 it has been found:

- Quadrant 1 predominates Asiatic car brands, *Mitsubishi, Toyota, and Matiz* respectively and partially *Peugeot*. This positioning denotes the fact that they are perceived as having a sport design; youthful, and they respond very well to the criteria of reliability, technical - economical maintenance;

• In quadrant 2 we can find the car brands *Cielo, Logan, Chevrolet, Renault, Skoda* and *Ford*, so the car brands most often met on the Romanian highways that are perceived as being expensive, with a low fuel consumption and bought by persons with medium income;

• In quadrant 3 there are grouped *Opel, Volkswagen* and *Smart* so those models which in photos represented coupe models, (*Smart, Opel Tigraand Volkswagen Bittel*) whose relation technical quality – economical maintenance is perceived as being very good;

• Quadrant 4 includes German car brands renowned for their reliability and most often bought just because of this quality, the safety and maintenance capability of the German producer.

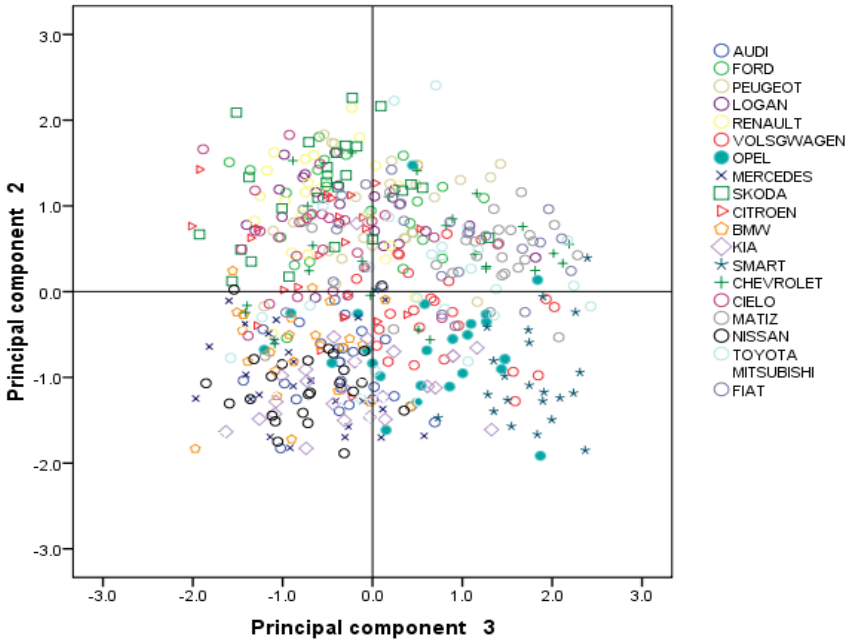

Figure 5. The map of the elements in bidimensional space PC2 and PC3

Analyzing graphic representation 6, it can be found out that:

• Quadrant 1 offers an identical group, *Matiz, Smart Mitsubishi* and *Volkswagen* car brands respectively, that except *Matiz,* are reliable car brands, strongly correlated with the future image of the subjects , which means individuals with their own income who need cars which can be easily parked, easy to be handled in traffic , with cheap insurances;

• Quadrant 2 includes *Opel, Chevrolet, Peugeot,* often met in the possession of

female drivers due to the exterior design of the body car;

- Quadrant 3 comprises Cielo, Logan Ford and Nissan which means the car brands most often met among family guys, future cars when the subjects will become family in their turn and when the necessity of owning a reliable car brand becomes an impediment and economical aspects receive a major importance;

- Quadrant 4 includes Renault, Audi, Citroen, BMW and Mercedes renown car brands, associated with business class, persons in leading positions as the subjects detailed during the attributes generation phase.

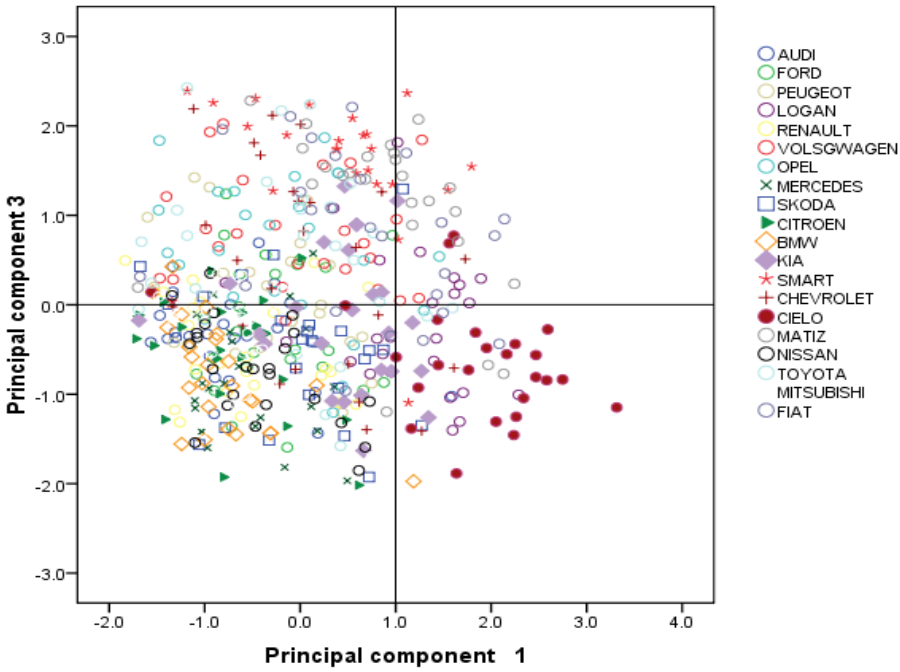

Figure 6. The map of the elements in bidimensional space PC1 and PC3

4. Discussion

Using descriptive statistics, we detailed - on each PC – the description of each element and of each construction. Thus for **PC1**, the results – under the shape of average scores calculated with the help of weighted arithmetic average (see Apendices Table A. 1 – 3), we can conclude:

- *Car brands with a modern body car design*: Audi, Mercedes, BMW, Citroen, Nissan and Mitsubishi;
- *Car brands with a "classic" design*: Cielo, Fiat, Matiz and Logan;

• *Car brands with the latest technical equipment* : Audi, Mercedes, BMW, Nissan and Mitsubishi;
• *Car brands without the latest technical equipment:* Logan, Cielo and Matiz;
• *Car brands with aerodynamic design :* Audi, Mercedes, Citroen, Nissan and Mitsubishi;
• *Car brands with high quality body car, resistant to impact*: Audi, Mercedes, BMW, Nissan and Mitsubishi;
• *Car brands dedicated to Romanian roads*: Logan, Kia, Cielo and Matiz with the mentioning that Kia had a SUV.
• *Car brands perceived as being expensive*: Mercedes and BMW, followed by Audi, Citroen, Nissan and Mitsubishi;
• *Car brands which insurances are acceptable*: Logan, Cielo, Matiz, Chevrolet and Smart.

For center **PC2**, the results Appendices 2 show that:

• *Car brands with a habitacle dedicated for two persons so sportive, young*: Audi, Opel, Mercedes, Nissan, Mitsubishi followed by BMW and Kia;
• *Car brands belonging to sport class through design and destination*: Audi, Mercedes, BMW, Nissan, Mitsubishi followed by Volkswagen, Opel and Kia;
• *Car brands destined to young people* : Audi, Opel, Mercedes, BMW, Nissan, Mitsubishi followed by Volkswagen, Citroen, Kia, Smart and Toyota;
• *The car brands most often met on Romanian roads* : Logan followed by Audi, Ford, Peugeot, Renault, Volkswagen, Opel, Skoda, BMW, Chevrolet, Cielo, Matiz and Fiat;
• *The most rarely car brands on Romanian highways*: Kia, Smart, Nissan, Mitsubishi;
• *The car brands most often bought by persons with high income or VIPs is*: Audi, Mercedes, BMW, Nissan and Mitsubishi;
• *The car brands most often bought by persons with medium income is*: Logan, Cielo, Matiz and Fiat;
• *Car brands with sport tyres*: Audi, Mercedes, BMW, Nissan and Mitsubishi;
• *Car brands with an "aggressive" design*: Audi, Mercedes, BMW, Nissan and Mitsubishi.

For **PC3**, the results from Appendices 3show that:

• *Car brands with big exterior size* : Ford, Logan , Renault, Skoda, Citroen, Cielo, French companies predominating here;
• *Car brands with great stability*: Mercedes, Nissan, Audi, Ford, Peugeot, Renault, Skoda, Citroen and Mitsubishi, without a clear delimitation of this attribute connected to the car producer;
• *Car brands with a low fuel consumption*: Volkswagen, Opel, Chevrolet, Smart, Matiz, Toyota and Fiat, so those small car models, with a daily frequency destination
• *Car brands which inspire "power"* are the German and the Asian ones, Audi and BMW, Nissan, Mitsubishi followed by Citroen and Kia, respectively;

• *Car brands with a cheap maintenance*: Logan, Fiat, Matiz and Cielo;
• *Car brands with an expensive maintenance*: Audi, Mercedes, BMW, Nissan and Mitsubishi.

The results of applying **PCA** to the personal constructions under the shape of attribute pairs confirms thus *Kelly's personal constructions theory, this instrument gives the possibility of a quantitative rendition, objective of qualitative variables, subjective.*

Because the possibilities of analyzing the data resulted from this research could have been achieved with different statistics methods – *the factorial analyses of the correspondences* (according to Fransella, Bell and Bannister, 2004: 96 - 97), *cluster analyses* (according to Jankowicz, 2004: 118) or directly *descriptive statistics on the constructions on every car brand* (according to Partington, 2002: 212) we set as future objective the continuation and the thoroughness of the present research with these methods – in separate studies - and finally a comparative study of the results of this research based on particularities, advantages and disadvantages of these possibilities to process the data collected using the Kelly grid.

5. Conclusions

The Kelly grid is one of the methods that unites the advantages of qualitative analysis with the quantitative ones, though there are authors that frame it together with the thorough interview, of group, half structured and the decision protocole as being a qualitative method (Worcester and Downham, 1986).

In the surveyed literature, the Kelly grid was applied in the auto field by Fransella only in 2005 and it is applied for the first time in Romania. The results of this research may contribute to Jankowicz (2004) by describing individual's opinions as parts of an attitude survey, the development of a new product by building on consumers; idea about, and preferences for existing products (for car brand from this research: intrinsic and extrinsic preferences)

By applying PCA a reduction of data has been realized, for a comfortable graphic representation and to emphasize the particularities of the 20 car brands referring to the perception of the attributes which describe these car brands, perceptual level - subjective, economic, technical – maintenance - reliability grouped on the three PC. Thus, the initial hypotheses of the research are confirmed according to which the car brands will be grouped in the following way:

• *According to the car brand origin:* it is confirmed because as it can be observed from Figures 4 - 6, car brands can be grouped in the following way: Asian, French and German;
• *According to the history of the car brands:* it is confirmed because placing them in groups according to the car origin confirms this hypothesis because German and French car brands are, "historic" car brands and Asian car brands are more recent

on the market;
• *According to the design of the body car and aspects connected to it:* the attributes connected to body car were generated when triads were extracted which contained the quality of the body car, more often met within German car brands;
• *According to aspects connected to reliability:* it is confirmed because the German car grouping is obvious, regardless the bidimensional combination of the three components.
• *According to aspects connected to maintenance;* it is confirmed because car brands such as *Logan, Matiz, Cielo* are most often spread among Romanian drivers, dealers and commercial representatives especially for attributes connected to maintenance;
• *According to symbolic significance, subjective related to the 20 car brands used in the study*. According to this hypothesis we have found out that a car brand such as *Logan* is taken into consideration as being a car brand for the future, but not the ideal image of the future but one which takes into account a more realistic scenario; the Asian car brands are perceived as being sportive car brands, young, this thing being perceived through the perspective of the futuristic design, of the recent appearance on the car market of these car brands , of the innovation in the high-tech domain of Asian car brands.

We can conclude that, the constructions, which form PC3, are more powerfully correlated in comparison with the constructions, which form the other two PCs, having correlation coefficients under the average. Besides achieving the three PCs, the method emphasizes a better visibility of the car brands distribution on the three PCs concerning the attributes perceived by the subjects. Taking also into account the group formation of the three PCs, the producers of these car brands have to approach future buyers in a different manner taking into account the perceivable visibility of each car brand.

From the results of this research, we agreed that repertory grid interview produces rich qualitative data and grid interviewing produces detailed explanations (Partington, 2002) and can be used for rapid new product development (Debackere et. al., 1996 in Partington, 2002, Isik & Yasar, 2015)

Market research is based on the needs that a product meet and on the functions that it accomplishes. Determination of needs or functions that a product accomplishes will depend on the identification of the significant dimensions or important attributes of the product that a consumer may judge a given brand or a trade mark.

The Kelly's grid - or "Kelly triads" (Bouroche, 1977: 51)–is a matrix used in this research in order to "discover the important attributes of product as regards utilities – consumer does not buy a product, but its functions namely those product attributes that meet the needs -, theproduct attributes being factors that drive the buying and that drive the buyer to identify a possible answer to a need.

Measuring preferences assumes first the knowledge of significat product or service attributes, as the buyer in fact asseses these attributes and not the product or service by itself.

The Kelly'sgrid is presented in the literature (Vavra, 1997: 95) – together with ordering of preferences and differentiating opportunities – as being a method recommended to identify the product attributes.

In the future research we intend to apply the Kelly's grid to the other type of subject because it is well known that the social context influences individuals' constructs (Partington, 2002).

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Appendix

Table A.1. Principal component 1

	Principal component 1						
	"futuristic car body design - "classic" car body design	with the latest technical equipment - without the latest technical equipment	retro design - modern design	aerodynamic design - non-aerodynamic design	high quality body car low quality body car	a car for Romanian roads - a car for foreign roads	an expensive car an acceptable car price
AUDI	5	5	2	5	5	2	4
FORD	3	4	2	4	4	3	2
PEUGEOT	3	4	2	4	4	3	2
LOGAN	2	2	3	2	2	5	2
RENAULT	4	4	2	4	4	3	3
VOLKSWAGEN	4	4	3	3	4	3	3
OPEL	4	4	2	4	4	3	3
MERCEDES	5	5	1	5	5	1	5
SKODA	3	4	2	3	4	3	2
CITROEN	5	4	2	5	4	2	4
BMW	5	5	1	4	5	1	5
KIA	4	4	2	2	4	4	3
SMART	4	3	2	2	3	3	2
CHEVROLET	3	4	2	3	3	3	2
CIELO	1	2	4	2	2	4	1
MATIZ	2	2	3	2	2	4	1
NISSAN	5	5	2	5	5	2	4
TOYOTA	3	4	2	3	4	3	3
MITSUBISHI	5	5	2	5	5	1	4
FIAT	2	3	3	2	3	4	2

Table A. 2. Principal component 2

	Principal component 2						
	two place habitacle - four/five place habitacle	sport class - business class	a model for young people - a model for old people	a car brand very often met on Romanian highways - a car brand rarely met on Romanian highways	prevailingly bought by persons with high income or VIP - bought by persons with medium income	sport tyres - standard tyres	"aggressive" design - "nice" design
AUDI	5	5	5	4	5	5	5
FORD	1	2	3	4	2	2	2
PEUGEOT	1	3	3	4	2	2	2
LOGAN	1	3	2	5	1	1	1
RENAULT	1	2	3	4	3	3	3
VOLSGWAGEN	3	4	4	4	3	3	2
OPEL	5	4	5	4	3	3	3
MERCEDES	5	5	5	3	5	5	5
SKODA	1	2	2	4	2	2	2
CITROEN	2	3	4	3	3	4	4
BMW	4	5	5	4	5	5	5
KIA	4	4	4	2	3	4	4
SMART	5	3	4	2	2	2	2
CHEVROLET	2	3	3	4	2	2	2
CIELO	1	3	2	4	1	1	2
MATIZ	1	3	3	4	1	1	1
NISSAN	5	5	5	2	5	5	5
TOYOTA	2	3	4	3	2	2	2
MITSUBISHI	5	5	5	2	5	5	5
FIAT	1	3	2	4	1	2	1

Table A. 3. Principal component 3

	Principal component 3				
	big exterior size - small exterior size	low stability - high stability	low fuel consumption - high fuel consumption	inspires “power” - inspires “simplicity"	expensive technical maintenance - cheap technical maintenance
AUDI	3	4	2	5	5
FORD	4	4	3	3	3
PEUGEOT	3	4	3	2	3
LOGAN	4	3	3	1	2
RENAULT	4	4	3	3	3
VOLKSWAGEN	2	3	4	2	3
OPEL	2	3	4	3	3
MERCEDES	3	5	2	5	5
SKODA	4	4	3	3	3
CITROEN	4	4	3	4	4
BMW	4	5	2	5	5
KIA	3	3	3	4	4
SMART	1	2	4	2	3
CHEVROLET	3	3	4	2	3
CIELO	4	3	3	2	2
MATIZ	1	2	4	1	2
NISSAN	3	5	2	5	5
TOYOTA	2	3	4	3	3
MITSUBISHI	2	4	2	5	5
FIAT	2	2	4	1	2