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Title: How Well does Brand Personality Predict Brand Choice? A Measurement Scale and Analysis using Binary Regression Models

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How Well does Brand Personality Predict Brand Choice? A Measurement Scale and Analysis using Binary Regression Models

Abstract:

The research proposes a methodology allowing both the construction of a brand personality scale and the test of the ability of the scale to predict brand choice. A brand personality scale is developed and tested via exploratory and confirmatory analyses. A brand personality structure composed of 12 facets is uncovered and allows clearly differentiating brands belonging to the same market. Predictive power of the scale is then tested using binary regression models.

How Well does Brand Personality Predict Brand Choice? A Measurement Scale and Analysis using Binary Regression Models

Brands belong to the daily life of individuals who might be attached, committed or loyal to some of them. The concept and reality of brand relationship leads managers to develop positioning strategies and marketing tactics directed at reinforcing the strength of the relationships between brands and their consumers. Recent research in this area has been devoted to understand both the nature of the brand-consumer relationships and the influence these relationships could have on consumer behavior. The concept of brand personality revived by Aaker is interesting in that it might explain the strength of brand-consumer relationships and consumer buying behavior such as brand choice or brand loyalty. Aaker's important contribution (1997) has been followed by other studies aiming at better defining or measuring the concept of brand personality (Caprara et al., 2001, Ferrandi and Valette-Florence, 2002).

Research on brand personality is recent and further work is still needed in terms of concept definition and measurement, particularly within different settings or cultures. One certainly needs to better understand the impact of brand personality on brand choice and buying behavior. This article is a contribution to that field of research. We develop a brand personality scale and test its validity. We apply the scale to two well-known international brands and show the differences of the two brands in terms of personality. Finally, we test the explanatory power of the personality scale on brand choice. The article is composed of three parts. We first present the conceptual framework and the definition of brand personality we will use in this study. We then present the methodology allowing the development and test of the personality scale. We finally show the results of the application of the scale to two

international competing cola brands (Coke and Pepsi) and present their brand personality profiles. We also test the explanatory power of the scale on brand choice with a binary regression model.

CONCEPTUAL FRAMEWORK

Human personality conceptualization and measurements have been developed for decades particularly in the domain of psychology. This will be rapidly reviewed, followed by the transposition of the personality concept to brands proposed recently (mainly by Aaker in 1997) and the problems linked to this transposition. We propose a definition of the brand personality concept and guidelines for the development of a measurement tool.

Human personality traits

The origin of personality traits research is ancient since it can be traced back to Théophraste (4^{th} century B.C.) who described different types of human characters and associated behaviors. However, in spite of the long research tradition, no unique and universally accepted definition of human personality traits prevails. Generally, they are defined as "*tendencies to show consistent patterns of thoughts, feelings and actions"* (Costa and McCrae, 1998). They are understood as being psychological cues that determine human action and experiences. Following the work of Allport (1937), Cattell (1950) and Eysenck (1960) considered as the founders of the dominant approach, a number of psychologists believe that the best representation of personality trait structure is given by the five-factor model, factors generally named the "Big Five" (John, 1990). This dominant paradigm describes personality through five basic dimensions that summarize a great number of distinct and specific characteristics of human personality. The Big Five are usually labeled O.C.E.A.N.: Openness

to experiences, Conscientiousness, Extraversion, Agreeableness and Neuroticism. These factors have been identified through two main approaches: the lexical approach and the hierarchical approach. In both approaches, the objective is to uncover the factorial structure of personality traits. The lexical approach (Goldberg, 1990) is based on the hypothesis that all important traits must have been encoded in natural language due to the centrality of these personality traits. A factor analysis of words used to describe personality traits must enable to uncover the structure and to identify fundamental dimensions of personality. This approach first applied in the English language is now sustained by emic studies conducted in numerous cultures. However, the lexical approach is difficult to implement because of the vast number of words to be analyzed.

The hierarchical approach considers that personality is structured around a limited number of factors, each factor being composed of characteristics. The personality factors are situated at the most abstract level of the hierarchy and can be divided into facets, themselves composed of basic personality traits. In spite of differences in terms of education, social structures, religion, age and language itself, it seems that all individuals can be described and differentiated along five basic personality dimensions (McCrae, 2000). However, this hierarchical conceptualization of human personality has been criticized (Block 1995). Problems such as the stability of the number of factors, their interpretation and meaning or the existence of culture-specific factors are yet to be solved.

Brand Personality

In spite of the impressive number of studies conducted in psychology aimed at conceptualizing and measuring the structure of human personality, no parallel research has been conducted in the field of consumer behavior before the seminal contribution of Aaker

(1997). We review the bases for the brand personality metaphor and highlight underlying limitations.

Concept foundations

Theories on self-reinforcement (Grubb and Grathwohl, 1967) and on congruence between self-image and brand image (Sirgy, 1982) postulate that consumer behavior is determined by the interaction between the personality of the consumer and the perceptions of the products which he prefers or purchases. It is along these lines that the concept of brand personality has emerged. Individuals tend to behave in accordance with the image that they have from themselves or that they wish to convey to others. Brands can be thought as a means to communicate these images (Belk, 1988, Schutz-Kleine et al., 1995) and the connexion between brands and personal identity has been conceptualized as a brand-consumer relationship (Fournier, 1998).

Animism theories consider that Humans need to anthropomorphize objects in order to facilitate their interaction with the world. Thus, consumers assign personalities to brands and may think of brands as possessing human personality traits. However, projecting personality traits on a brand is not enough to create a real consumer-brand relationship. Brands need to be active partners in the possible relationship. Marketing activities of the brands such as communications can create this partnership and may be perceived, analyzed and considered by consumers as being behaviors and personality traits as those of a Human being (Plummer, 1984, Blackston, 1993). Hence, just as individuals synthesize information on behaviors of others persons in terms of personality traits, consumers might project personality traits to brands (Caprara et al., 2001). Managers rely on the image of the typical brand user or the set of human characteristics that consumers associate with the typical user, on endorsement by celebrities, on product attributes, symbols, logos and slogans or any means of personification

to develop the associations of brand personality (Batra et al., 1993; Levy, 1959; McCracken, 1989). Contrarily to product attributes which are mainly functional, brand personality tends to have a symbolic function and one of self-expression (Keller, 1993, Phau and Lau, 2001).

Problems linked to the concept of brand personality

These problems pertain to three domains: conceptualization, measurement and semantics.

Conceptualization

If brand personality is a convenient metaphor to describe stable characteristics associated to brands, the concept originally used by advertising agencies has not been defined properly before the work of Aaker (1997). Aaker defines brand personality as "*the set of human characteristics associated with a brand"*. However, this definition seems too general and may lead to the inclusion, within the brand personality concept, of items having no equivalent at the human level, as indeed revealed in the results of Aaker's work (items such as *provincial* or *aristocratic* which can be considered as social judgments). Moreover, contrasting with the concept of brand image (a generic term corresponding to the whole set of representations the consumer has with respect to a brand -Dobni et Zinkhan, 1990-), brand personality should be more specific and should be defined through traits utilized to characterize an individual. It should offer the opportunity to transfer meaning from human personality of consumers to brand personality of the brands they prefer, purchase or reject. Therefore, we define brand personality as "*the set of human personality traits associated with a brand"*.

Measurements

Brand personality scales have been developed based on human personality measurements. Three types of methodologies have been applied:

(1) A hierarchical approach used by Aaker (1997) or Costa and McCrae (1998). Aaker identifies 42 traits and five brand personality factors: *sincerity, excitement, competence, sophistication and ruggedness*. This model originally developed in the English language and with data collected on American respondents has allowed differentiating products, services and retail brands (Bauer et al., 2000, d'Astous et al. 2003, Siguaw et al., 1999). However, some studies question the applicability of the original scale in different contexts (Aaker et al., 2001, Ferrandi et al, 2000).

(2) A lexical approach use by Caprara et al. (2001) who applied to brands the human personality scale they developed in Italy. Results lead the authors to question the transferability of a human personality scale to brands.

(3) The direct application of a human personality scale to brands. Ferrandi and Valette-Florence (2002 a, b) have applied to brands the Mini-Markers human personality scale developed by Saucier (1994). After having purified the original scale and retained the items having a positive meaning, the authors show some congruence between human personality of individuals and brand personality of brands purchased.

Semantics

The question remains whether items retained to describe human personality and brand personality can be identical. Although the concepts of human and brand personalities might be similar, both constructs are different in their antecedents and in the roles they play. Human personality traits are created and communicated to others via attitudes, behaviors or physical characteristics (Park, 1986). They are thus inferred directly by others. By contrast, brands are inanimate objects which are associated with personality traits essentially through marketing communications (Plummer, 1984) and brand usage by oneself or by others. However, brand personality and human personality do exhibit similarities: both are durable and might, at least

under given conditions, help explain and predict the actions of individuals belonging to the target (see Fournier, 1998 and Aaker et al., 2001 for brand personality and Park, 1986 for human personality). Therefore, there could be some semantic similarities between human and brand personality concepts. Ferrandi and Valette-Florence (2002a) have tested this hypothesis in applying the Saucier human personality scale to both brand users and brands. They uncovered a similar scale structure, although the original scale had to be purified and reduced. Considering the remaining questions concerning the meaning and measurement issues linked to brand personality, the objective of this research is to develop and test a new brand personality scale. The methodology followed is to construct a scale based on published findings (items used in previous research) and to generate new brand personality items. Scale purification and validation are conducted. The capacity of the scale to clearly differentiate brands and to explain brand choice is then tested.

SCALE DEVELOPMENT AND TESTING

The classical steps (item generation, purification of the scale and validity tests) were followed.

Generation of items

Generation of items was performed through a two-step procedure:

(1) Selection of items from existing scales: we gathered 112 items from the scales developed by Aaker et al., 2001, Caprara et al., 2001, Ferrandi et al., 2000 and Ferrandi and Valette-Florence, 2002a). A convenience sample of 161 business students evaluated these items in terms of their ability to describe brands or perceptions about brands.

(2) Generation of new items by consumers and experts: we used the technique of nominal groups (Claxton at al., 1980) to induce consumers and experts to elicit words they would use to describe brand personalities. Three experiments were conducted with a

group of six university experts and two groups of eight consumers. The mean number of items generated by each group was 130. Each group participant was asked to evaluate individually, on a 7-point scale, the semantic content of each item and their ability to describe a brand as a person (both items generated by the groups and items selected from existing scales).

Selection of items

Items purification was completed through two steps:

(1) Selection of items based on item evaluations. Items from existing scales were retained if the mean evaluation score was greater than 4 (on a 5 point scale). Items from the list generated by experts or consumers were selected if mean score was greater than 5.5 (on a 7 point scale). After this first purification phase, 88 items were kept for further analysis.

(2) Elimination of identical or redundant items. Experts eliminated items judged as identical and grouped items judged as very similar. Among group of items judged similar, only the item best evaluated was retained.

At the end of this phase was obtained a final list of 69 items best able to describe brand personality.

Scale Testing

The scale of 69 items was tested with four brands selected for their awareness and penetration levels so that virtually all respondents would have a reliable judgment of brand personalities. The 4 brands are composed of two pairs of brands, each pair competing on the same market (Coca-Cola and Pepsi-Cola on the one hand, Nike and Adidas on the other hand).

Data were collected on a sample of 387 business students from a French university who were asked to furnish their judgments of brand personality for the 4 brands on the list of items, using a 1 to 7 Likert scale.

The personality scale structure was then tested. Based on results obtained after performing principal component factor analysis with promax rotation, an iterative procedure allowed purification of the measurements through successive elimination of items ill-represented on the factors (communality inferior to 0.5). This led to an order 1 structure composed of 33 items loading on 12 dimensions (see Table 1).

INSERT TABLE 1 HERE

Lastly, validity of scale structure was tested by means of trait validity performed through a confirmatory factor analysis, the results of which were validated via a systematic bootstrap procedure. Trait validity and discriminant validity were assessed (t tests associated to each factorial weight, mean extracted variance and the ρ internal coherence coefficient of Jöreskog). In table 2 appear the indicators of convergent validity and reliability. Results are satisfactory and show good trait validity for the uncovered personality scale. The scale contains some of the factors proposed by Aaker (1997) as well as new ones.

INSERT TABLE 2 HERE

DESCRIPTION OF BRAND PERSONALITIES

The measurement of brand personality is managerially interesting if it allows description of the personality of the brands and differentiating competing brands. Managers may better

understand major brand associations and identify target groups sensitive to some personality traits. The difference in brand personalities for brands Pepsi and Coke was tested through an analysis of variance. The analysis was conducted on the factor scores obtained for the two brands on the 12 personality dimensions. Results show that the two brands exhibit specific personality traits (see table 3 for results of analysis of variance). Figure 1 shows brand personality structure of the two brands. The two brands differ on 8 personality traits (out of 12). The four traits on which there is no difference between the brands (at $p<0.05$) are *natural, mature, exciting and mischievous*.

INSERT TABLE 3 HERE

INSERT FIGURE 1 HERE

Typical of the French market on which Coke has a very dominant position (it has more buyers than Pepsi and Coke buyers purchase more), brand Coca-Cola is better perceived than Pepsi on the 8 personality facets on which there is a difference between the two brands.

EXPLANATION OF CHOICE BEHAVIOR

An important question is that of the power of brand personality to explain consumer behavior measurements such as brand consideration (presence or not in the consideration set), preference or choice. We collected choice data asking respondents to indicate the product they would choose on next purchase occasion. Choice data was analyzed using binary regression trees which were preferred to discriminant and logit analyses. These two analyses consider all variables at once whereas the binary classification model is a hierarchical and recursive approach with which variables are considered sequentially at each classification step. A same explanatory variable might be selected more than once at different stages of the analysis. At

each stage, the variable allowing to best explain choice is selected. A measure of the relative importance of explanatory variables has been proposed by Breiman et al. (1984). Applying the binary regression model to the data allows correct classification of 76.9% of the cases for brand Coke and of 59.4% of the cases for brand Pepsi (see table 4). These results largely outperform those of the traditional discriminant and logit analysis (correct classification of cases is 58.5% and 34.2% for Coke and Pepsi with discriminant analysis and 95% and 15% with the logit).

INSERT TABLE 4 HERE

Interpretation of data is based on the identification of explanatory variables selected in the hierarchical tree. Beyond this description which allows understanding of the choice process, results of the analysis should be interpreted following three main criteria: (1) stability of the solution, (2) parsimony of the classification tree and (3) relative importance of each predictive variable.

Stability of the solution is assessed through a classical systematic cross-validation procedure so as to avoid the risk of capitalizing on chance (Breiman et al., 1984). In our case, the high rate of correct classification remains unchanged, which guarantees the reliability of the results. Breiman's procedure was applied to compute the relative importance of each variable (see Figure 2).

INSERT FIGURE 2 HERE

Globally all personality traits contribute to explain the choice between the two brands. However, four traits appear to be more important than others (*secure, mature, mischievous* and *exciting*). The classification tree (Figure 3) is quite parsimonious since it is composed of 9 terminal nods. This allows having a clear understanding of the hierarchical process explaining choices between Coke and Pepsi. The tree also indicates that consumers do not have a unique choice process and allows identification of groups of consumer sharing the same process.

INSERT FIGURE 3 HERE

Interpretation of results

The tree should be interpreted by looking at the variable which best explains choice. For example, at the first level of the hierarchy, it is the variable "*secure*" that best distinguishes consumers choosing predominantly Coke from consumers choosing predominantly Pepsi. At each level is also indicated the number of cases. Total number of cases is twice the number of consumers since are associated two observations per consumer (the brand chosen and the brand not chosen). At the first level of the hierarchy, there are 568 cases where Coke is predominantly chosen and 206 cases where Pepsi is predominantly chosen. The value of the variable which allows separation of the groups is also indicated. This value is the factor score of individuals resulting from the factor analysis with which we identified the 12 personality traits. For predominantly Coke-chosen cases, the mean factor score value on dimension "*secure*" is greater than -.516 and is inferior or equal to that level for the predominantly Pepsi-chosen cases.

Interpretation of the choice processes is quite straightforward when beginning by the ending nodes of the tree. For example, on the left side of the tree, what best explains the choice of

Coke or Pepsi is the personality trait "*mischievous*", where the scores of Coke are high compared to those of Pepsi. This choice process concerns 206 cases out of 774 or 27%. For these cases the perceived level on personality trait "*secure*" is quite low for both products (inferior to -.52). Analysis of the right hand side of the tree indicates that for a big number of cases, brands are chosen based on the trait "*secure*". For 270 cases (with a level on dimension "secure" greater than -.52 and a level on dimension "*cheerful*" smaller than .40), 26 are in favor of Pepsi because of a high perceived level on the personality trait "*secure*" (consumer group 5). Security also explains the choice between Coke and Pepsi for the remaining 298 cases. Coke (215 cases) is dominantly chosen for high levels of that dimension (>.29). For the 83 cases with a predominant choice for Pepsi (consumer group 6), Pepsi has satisfactory level on dimension "*secure*" (between -.52 – first level of the hierarchy – and .29 – third level). Pepsi is considered "*cheerful*" (greater than .40). The 215 Coke cases are then re-decomposed: 117 cases correspond to a choice of Coke (consumer group 7), the brand not being considered highly "*exciting*" (scores < .79). The 98 cases for which Coke is considered very exciting, what distinguishes the choice between Coke (74 cases – consumer group 9) and Pepsi (24 cases – consumer group 8) is the level of perception on the "*natural*" personality trait.

The relative parsimony of the tree shows that among all personality traits, few have real explanatory power in terms of choice. Although the two brands have different personalities on 8 of the 12 personality traits of the proposed scale, only 4 of these traits really play an important role in explaining choice behavior (*secure, exciting, mature and mischievous*). The decomposition tree includes the traits that were previously identified as important (shown in Figure 2) but for the trait "m*ature"*. The tree identifies the traits that best distinguish the Coke choices from the Pepsi ones. The trait "m*ature"* does not clearly contrast the cases within the partitions obtained. It is however important at the aggregate level. Of course, one should also

bear in mind that other variables not considered here and not linked to brand personality have an impact on choice. The experimental design allows controlling some of these variables such as availability, but it is clear that key variables such as taste have not been included in the model.

Description of consumer groups

Another interesting result is that the methodology leads to the identification of different choice patterns based on personality perceptions:

- Among the cases with low levels on dimension "*secure*" the sole personality trait "*mischievous*" allows to explain choice. This process is quite simple.
- Among the cases with higher levels on security, the personality trait "*cheerful*" allows a further split (albeit no direct explanation of choice). For low levels of "*cheerful*", it is again perceived security which explains choice. This process is also simple. For higher levels of cheerfulness, the personality traits "*exciting*" and "*natural*" explain choices. This choice process involving 4 personality traits is more complex.

CONCLUSIONS

This research proposes a brand personality measurement scale developed in France. Our goal was to try to answer some criticism on personality scales applying semantics originally developed for the measurement of Human personality. The structure uncovered here is composed of 12 personality facets and the scale shows good levels both of reliability and validity. However, the number of dimensions is well above the number of facets (five) proposed by Aaker (albeit quite close to the 15 facets she proposed) and above the 5 facets found in the "Big Five" Human measurement tools. Brand personality measurements might depend on cultures and languages as has been already been found in previous research. It

could also be that a higher order analysis conducts to a more limited number of personality facets. This was not the case with our data set but indeed other data sets should be used for re-testing of the scale structure. Also, we believe that the classical analysis used here in terms of scale development and testing could be further refined. A direction could be to verify whether the selected traits and items would apply to any brands (as Human personality scales apply to all Humans). Universality of brand personality scales is certainly an issue in terms of consumer types, usage occasions and brands. We strongly recommend further research in this direction.

From a more operational standpoint, we also believe that questions linked to the use and effects of brand personality are an important area of research. We have tested here the impact of brand personality measurements on choice in an experimental setting. This is an interesting first step. This test has raised an important methodological question which is that of the analytical method that could be used to measure how brand personality explains consumer behavior (choice in our case). Traditional methods such as discriminant analysis or logit models did not give good explanatory results which is certainly linked to the heterogeneity in the decision processes of the consumers. We applied a binary regression model which offered some insights concerning consumer heterogeneity and also results concerning what brand personality traits affect choice. Application of this method allowed correct classification of almost 72% of binary choices. Of course, our results are linked to the brands studied here (the Cola market). But beyond the particular results of this study, what we found is that a limited number of personality traits do play a role in explaining choice. This is probably the case for other product categories although the explanatory brand personality facets will surely vary across categories. This again will raise the question of the universality of the brand personality concept. What is important in terms of brand management is to identify the

important facets for the particular category under study. It is on these brand personality facets that the managers should concentrate their attention. Other dependent variables could also be studied. Choice was here measured but we believe important to try to link brand personality measurements to other constructs such as consideration, preference or repeat purchase behavior. Further research in these directions will allow a better understanding of the impact of brand personality on consumer behavior. Finally, we would suggest further studying the link between perceived brand personality and Human personality traits of the brand buyer or the brand loyal consumer. If brand consumption or possession is a means to express self-image or to communicate one's desired image to others, brand personality should play a role in the process.

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Table 1: Structure of the Brand Personality Measurement Scale

	Loading	t		Loading	t
GLAMOROUS			CHEERFUL		
Charming	.805	40.75	Trendy	.772	39.99
Sophisticated	.628	24.38	Joyful	.664	26.01
Voluptuous	.804	46.03	Spirited	.776	54.06
ELEGANT			RIGOROUS		
Elegant	.782	35.66	Determined	.745	40.42
Stylish	.737	35.98	Efficient	.578	19.93
Good Looking	.795	43.76	Intelligent	.747	33.99
EXCITING			MATURE		
Funny	.750	35.45	Adult	.523	14.13
Imaginative	.717	32.62	Discreet	.635	21.24
Original	.722	31.65	Thoughtful	.619	16.74
RELIABLE			MISCHIEVOUS		
Comforting	.727	39.20	Youthful	.442	14.70
Robust	.670	32.14	Comical	.760	21.38
Secure	.737	36.29			
NATURAL			SECURE		
Environmentally-friendly	.570	14.68	Reliable	.561	14.35
Natural	.776	19.12	Successful	.595	17.60
SWEET			OUTGOING		
Likable	.790	44.61	Lively	.753	33.09
Affectionate	.795	45.79	Popular	.627	25.36
Friendly	.771	37.01	Sporty	.697	29.36

Table 2: Reliability and Validity of the Scale

Validity indexes	
RMSEA	.0765
GFI	.862
AGFI	.804
Convergent validity ρ_{VC} (t>2 for all ρ's)	
GLAMOROUS	.56
SECURE	.33
OUTGOING	.48
SWEET	.62
EXCITING	.53
ELEGANT	.60
MISCHIEVOUS	.39
CHEERFUL	.55
MATURE	.35
NATURAL	.46
RIGOROUS	.48
RELIABLE	.51
Reliability (Jöreskog's ρ)	
GLAMOROUS	.79
SECURE	.50
OUTGOING	.74
SWEET	.83
EXCITING	.77
ELEGANT	.82
MISCHIEVOUS	.54
CHEERFUL	.78
MATURE	.62
NATURAL	.63
RIGOROUS	.73
RELIABLE	.76

Table 3: Results of the Analysis of Variance

Brand Personality Factors	F	Sign.
GLAMOROUS	5.332	.021
SECURE	18.738	.000
OUTGOING	4.559	.033
SWEET	8.139	.004
EXCITING	3.188	.075
ELEGANT	4.110	.043
MISCHIEVOUS	2.310	.129
CHEERFUL	8.326	.004
MATURE	0.024	.877
NATURAL	0.121	.728
RIGOROUS	6.332	.012
RELIABLE	8.369	.004

Table 4: Choice Confusion Matrix

	Coke *(observed)*	**Pepsi** *(observed)*
Coke *(predicted)*	432 *(76.2%)*	84
Pepsi *(predicted)*	135	123 *(59.4%)*
Total	567 *(100%)*	207 *(100%)*

Figure 1: Personality Profiles of Coke and Pepsi (total sample mean scores)

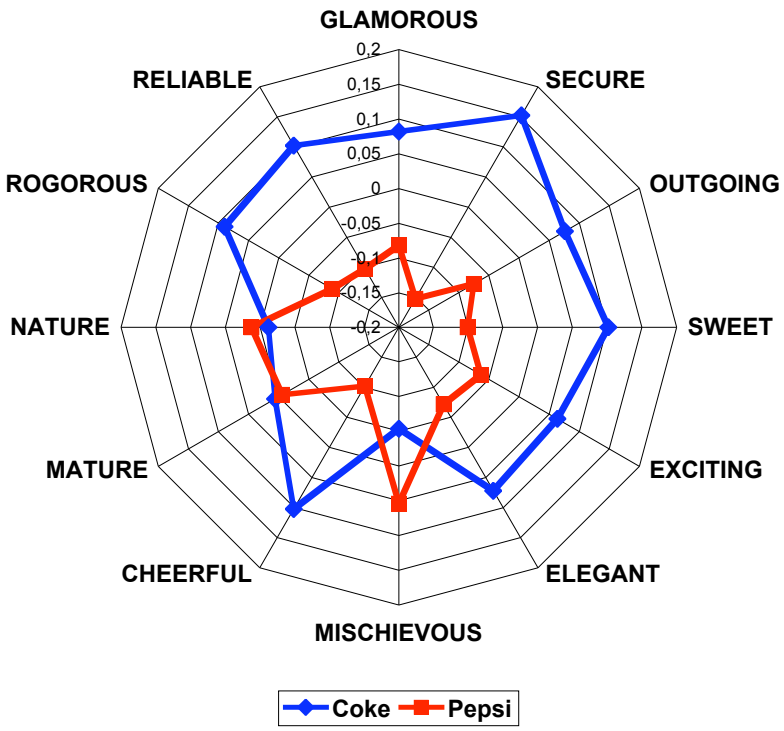


Figure 2: Importance of Brand Personality Traits for Explanation of Brand Choice

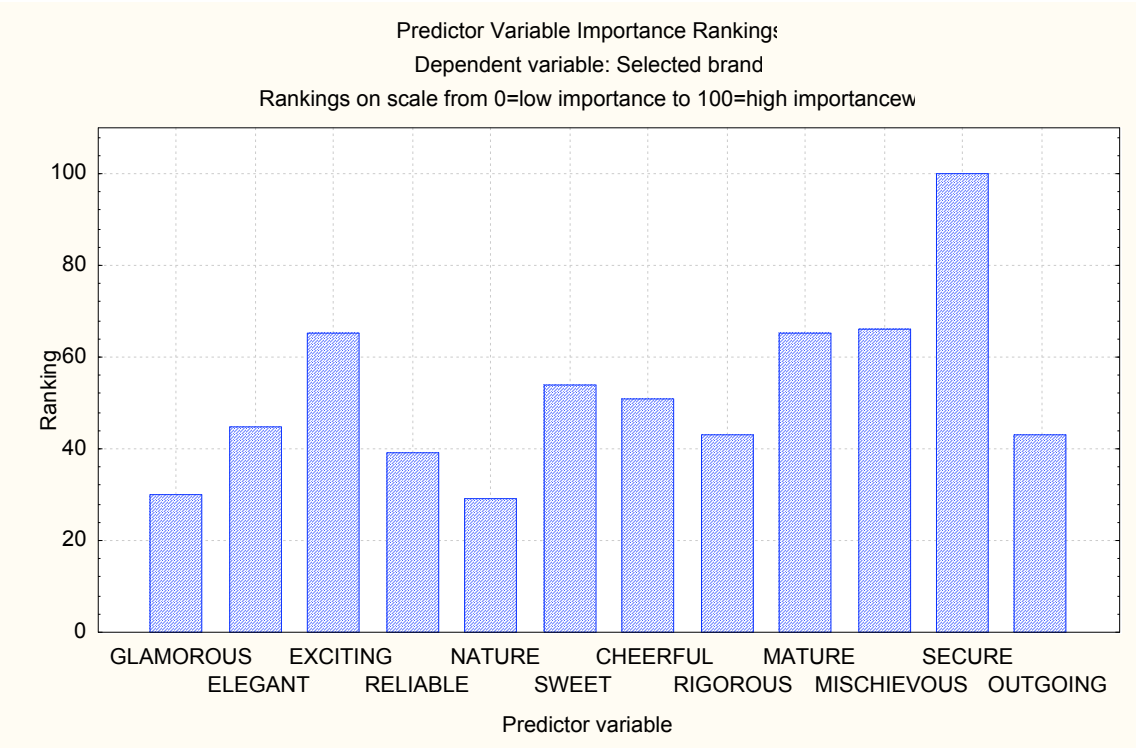
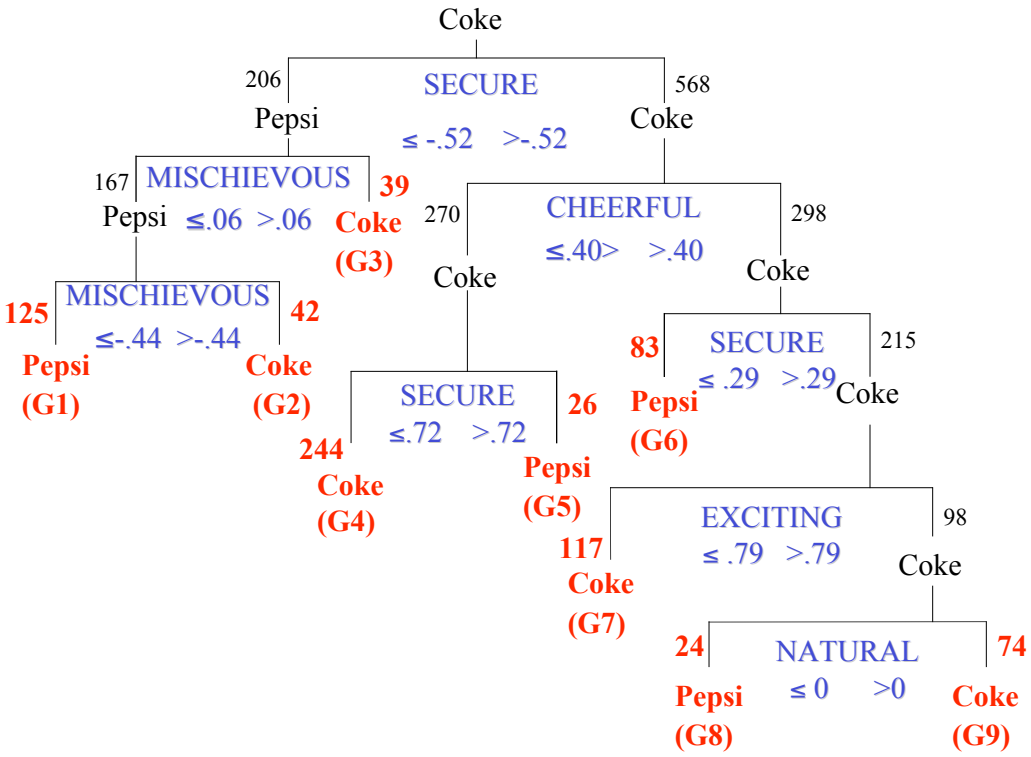


Figure 3: Binary Regression Tree explaining Brand Choice



(G1: designates consumer group number 1)