

PERSONAL INTERACTION FACTORS IN SALES PROCESS IN AUTOMOTIVE INDUSTRY (BULGARIAN CASE)

Elena Rihova – David Riha – Michael Stros – Vladimir Zhechev

Abstract

Personal sales process is a process of person-to-person communication between a salesperson and a prospective customer. The goal of the process is learning the customer's needs and seek, and then try to satisfy those needs by offering the opportunity to buy something of value. Notably is, there are many cultural and intercultural differences in sales process. To succeed, these differences must be studied and applied. In this paper we present the results of long - term study about intercultural differences in sales process on automotive industry. We determine the personal factors in sales that are most relevant to achieving sales success in Bulgaria. The research will a) allow researchers to obtain a better understanding of the personal sales process, and b) allow salespersons to develop more efficient personal sales approaches. The study utilized an observational design approach. The resulting data was analysed via factor analysis. A conceptual personal sales model is advanced. The model suggests that salesperson authenticity effects sales success.

Key words: Multivariate statistics, factor analysis, personal sales

JEL Code: M31, C38

Introduction

Based on Hagen's study the face-to-face conversation in sales process hold on in three meta-levels: affection, behaviour and cogitation (Hagen, Amin, 1997). Every of those level can have different significant, for each person. According above mentioned study, there are some gender differences between men and women perception in personal sales process (Hagen, Amin, 1997). Hence, one of the task of current research is to determine, if there are some differences between men and women perception of personal sales process in case of Bulgarian customer.

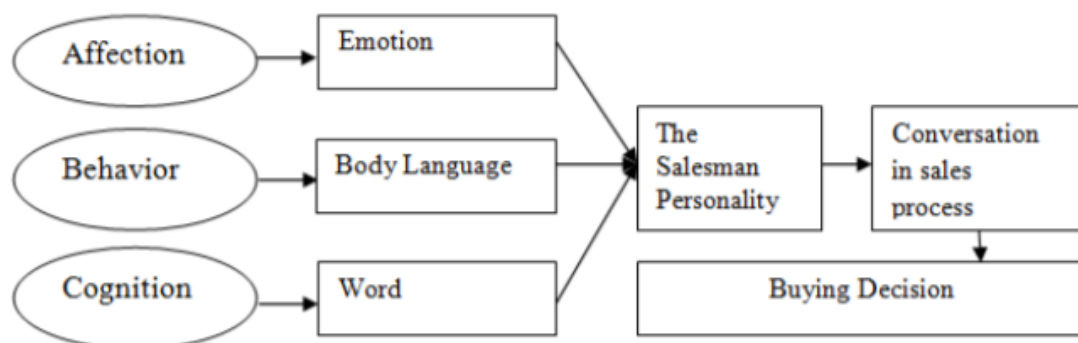
Consumer and salesman behaviour, their impacts on sales success was also studied by Bande (Bande, 2015), by McFarland (McFarland, 2016), and by Shannahan (Shannahan, 2015). All of those authors stayed, that emotional intelligence, which including all those three meta – levels, authenticity impacts success of the sales process. Important thing is, that this ABC model just

is only common model, and every country has its own traditions, cultures and hence each nation has its own model of behaviour, including of consumer behaviour. In this paper we try to answer the main question, if the behaviour of Bulgarian consumers different from the proposed general ABC model. The study utilized an observational design approach. Personal selling scenarios were filmed and shown to respondents who completed a sales effectiveness survey. The resulting data was analysed via a factor model.

1 Personal sales

Conversations in the sales process are under way by three objects: business, product and salesman. Current research focuses on authenticity as on a key factor in the successful sales sale process. Salesmen have been expressing emotions, their communicate through body language and present their know-how. If customers perceive this interplay as authentic, it has a positive effect on buying decision. It also corresponds with the generally accepted hierarchy ABC concept of consumer behaviour (Fig.1).

Fig. 1: ABC model of consumer behaviour



Source: autor

All those levels in ABC concept has sublevels. Thus, level „Affection“ can be describe with the help of „happy“, „pleased“, „satisfied“, and others variables. Level „Behaviour“ can be describe with the help of the variables: true to himself; communicates according to his values and beliefs; he communicates authentically; he is giving his own opinion; he feels alienated from himself; he has a high level of self-esteem. As it is obvious, the number of variables is great. The aim is to find out whether if all variables have an impact on sales success, and if there is a different perception between women and men. Then, however, it is important to find the hidden link between this variable to describe the perception of consumers with the fewer

number of variables and determine what are the most important for successful sales. To fulfil this aim the factor analysis will be used.

2 Factor analysis

Marketing searching for an accurate and tidy description of sales abilities lead to the necessary of using of factor analytic methods. The goal of factor analysis is understand of causes. Therefore, factor analysis studies and describes variability among observed correlated variables with the help of lower number of unobserved variables, called factors. Because the latent factors, are thought to cause and summarize responses to observed variables, score validity evaluation is closely related to factor analysis.

Using factor analysis the hidden factors can be identified. Those factors are responsible for the existence of linear statistical correlation between variables. And what is the key concept of factor analysis? The key concept of factor analysis is an association of multiple observed variables with a latent variable. Then, according to Horn (Horn, 1965) factor analysis is based on correlation matrix. Important is to assess the total correlation of data structure. On this step can be defined, if factor analysis can be applied on current data set. In case, if the total correlation is more, than 0.30, factor analysis can be applied.

The next significant step is selecting a number of factors. Ordinary, is used those factors, whose eigenvalues greater than 1 or cumulative percentage of those factors is more, than 70%. And last steps are - to calculate the factor weight for each factor, or another words, to define the correlation structure of each of the original variables with the current factor. Then, to determine the factor scores for each factor.

2.1 Mathematical model of factor analysis

Essentially, the model of factor analysis is motivated by the following argument. Variables are grouped by their correlations. In other words, all variables within a factor are highly correlated among themselves, and are small correlated with variables in an other factor (Horn, 1965). \mathbf{X} is the random vector has p components, and μ is the mean and Σ is the correlation matrix. The assumption of the factor analysis is, that \mathbf{X} is linearly correlated with a few latent variables F_1, F_2, \dots, F_n , than p is an additional sources of variation $\varepsilon_1, \varepsilon_2, \dots, \varepsilon_p$. Based on this, the factor model can be described as:

$$X_1 - \mu_1 = l_{11}F_1 + l_{12}F_2 + \dots + l_{1n}F_n + \varepsilon_1$$

$$\begin{aligned} X_2 - \mu_2 &= l_{21}F_1 + l_{22}F_2 + \dots + l_{2n}F_n + \varepsilon_2 \\ X_p - \mu_p &= l_{p1}F_1 + l_{p2}F_2 + \dots + l_{pn}F_n + \varepsilon_p \end{aligned} \quad (1)$$

Then, the matrix notation:

$$\mathbf{X} - \boldsymbol{\mu} = \mathbf{LF} + \boldsymbol{\varepsilon}, \quad (2)$$

where l_{pn} are loadings of the i th variable on the j th factor, then the matrix \mathbf{L} is the matrix of the factor loadings. All p deviations are described as $X - \mu$ and expressed in the terms of $F + \varepsilon$.

This model has certain covariance relationships. All covariance must be vitrified (Cattel, 1966, Rice, 2007).

The covariance verification:

$$E(\mathbf{F}) = 0, Cov(\mathbf{F}) = E[\mathbf{FF}'] = \mathbf{I} \quad (3)$$

$$E(\boldsymbol{\varepsilon}) = 0, Cov(\boldsymbol{\varepsilon}) = E(\boldsymbol{\varepsilon}\boldsymbol{\varepsilon}') = \boldsymbol{\Psi} = \begin{bmatrix} \psi_1 & 0 & \dots & 0 \\ 0 & \psi_2 & \dots & 0 \\ \dots & \dots & \dots & \dots \\ 0 & 0 & \dots & \psi_p \end{bmatrix}, \quad (4)$$

Then \mathbf{F} and $\boldsymbol{\varepsilon}$ can be called as independent.

The orthogonal factor model implies a covariance structure is following:

$$(\mathbf{X} - \boldsymbol{\mu})(\mathbf{X} - \boldsymbol{\mu})' = (\mathbf{LF} + \boldsymbol{\varepsilon})(\mathbf{LF} + \boldsymbol{\varepsilon})' = \mathbf{LF}(\mathbf{LF})' + \boldsymbol{\varepsilon}(\mathbf{LF})' + \mathbf{LF}\boldsymbol{\varepsilon}' + \boldsymbol{\varepsilon}\boldsymbol{\varepsilon}' \quad (5)$$

and, than

$$\boldsymbol{\Sigma} = Cov(\mathbf{X}) = E(\mathbf{X} - \boldsymbol{\mu})(\mathbf{X} - \boldsymbol{\mu})' = \mathbf{LL}' + \boldsymbol{\Psi} \quad (6)$$

Then,

$$Cov(\boldsymbol{\varepsilon}, \mathbf{F}) = E(\boldsymbol{\varepsilon}, \mathbf{F}') = 0 \quad (7)$$

Also, can be defied:

$$Cov(\mathbf{X}, \mathbf{F}) = E((\mathbf{X} - \boldsymbol{\mu})\mathbf{F}') = LE(\mathbf{FF}') + E(\boldsymbol{\varepsilon}\mathbf{F}') = \mathbf{L} \quad (8)$$

Thus, the covariance structure for the factor model can be described as following:

$$Cov(\mathbf{X}) = \mathbf{LL}' + \boldsymbol{\Psi} \quad (9)$$

$$Cov(X_i, F_j) = l_{ij} \quad (10)$$

The model $\mathbf{X} - \mu = \mathbf{LF} + \varepsilon$ is linearity to the common factors. The second one thing in the factor analysis is communality. The communality can be described as:

$$\text{Var}(X_p) = \sigma_{pp} = h_p^2 + \psi_p, \quad (11)$$

and, the communality is:

$$h_p^2 = l_{i1}^2 + l_{i2}^2 + \dots + l_{iq}^2 \quad (12)$$

Case study

The original Bulgarian data set includes 156 points (after deleted missing dates) and 26 variables. The distribution normality of the data set and subsequently correlation matrix of the data are. To conclude the analysis, data obtained from the survey and video coding are merged and standardized for analysis using MATLAB. The quality of the collected data is assessed in terms of outliers, missing values, skewness and kurtosis. All tested values are within the acceptable range, according to Bortz and Doering (2006). Based on this review, 19 variables are excluded from the factor analysis. Due to the small size of the data set, the gender breakdown is not performed.

First of all, is provided correlation test. Bartlett's test is used to test the null hypothesis: the correlation matrix is an identity, and the counted significance level is less than 0.05. The latter test proved significant and factor analysis is therefore appropriate for the studied datasets.

Tab. 1: The results of the Test of Sphericity

Bartlett's test of sphericity Bulgarian	App. ChiSquare	2303.05
	Sig.	0.000

Source: autor

The purpose of data extraction is to condense a large number of items into a set of factors. When determining these factors, the simultaneous use of multiple decision rules is recommended (Thompson and Daniel, 1996). Hair et al. (1995) confirmed this point by highlighting that the majority of factor analysts use several criteria. Typical criteria include Kaiser's criteria (eigenvalue greater than 1), the Scree test (Cattell, 1966), and the cumulative percentage of variance extracted (Horn, 1965).

Based on the above decision rules, the authors concluded that the dataset should be analysed for two factors, since the eigenvalues in this case are greater than one for two factors. (see Tables 2).

Tab. 2: Eigenvalues for the data set Bulgarian

Index	Eigenvalues	Cumulative percentage
1	2.177781	39.10
2	1.100732	76.15

Source: autor

Tab. 3: Factor Loadings - Correlations between Factors and Variables for the data set Bulgarian

Factor 1	Factor 2	Variables
0.8913	-0.19153	The content and style of the speech does refer to what is spoken
0.8810	0.1574	He is true to himself
0.8514	0.0784	The speaker's points flow logically from one to the next
0.7919	0.0777	The content and style of the speech does refer to what is spoken
0.7521	0.0686	He is giving his own opinion
0.1173	0.7431	Pleased
0.1098	0.6835	Happy
0.0901	0.6533	Satisfied

Source: autor

As can be seen from Table 3, the first factor is most affected by the variable “The content and style of the speech does refer to what is spoken” (0. 8913), followed by the variable “He is true to himself” (0. 8810), then by the variable “The speaker’s points flow logically from one to the next” (0. 8514) and “The content and style of the speech does refer to what is spoken” (0.7919), and finally by the variable “He is giving his own opinion” (0. 7521). The second factor is most affected by the following variables (in order of importance): “Pleased”; “Happy”; “Satisfied”.

Based on the goal of factor analysis - to simplify the factor structure of a group of items (Costello, 2005), we can approve, that the goal is achieved.

Conclusion

The resulting data was analysed via a factor model. All correlation between variables were verified. Finally, the following outputs were obtained: were identified only two personal factors of the salesman, which are more relevant to achieving sales success in case of Bulgarian customer. The first factor had five variables and the second one only three.

For Bulgarian customer is the most important “Spoken Word”, and less important is “Personal impression”. The first factor included “The content and style of the speech does refer to what

is spoken”, followed by the variable “He is true to himself”, then by the variable “The speaker’s points flow logically from one to the next” and “The content and style of the speech does refer to what is spoken”, and finally by the variable “He is giving his own opinion”. The second factor included the following variables (in order of importance): “Pleased”; “Happy”; “Satisfied”.

It should be noted, due to the low number of respondents, it was decided not to analyse gender-based perception. In the next study, it is planned to collect a sufficient number of respondents' answers, so it will be possible to analyse perception of men and women separately.

References

- Bande, B. How and When Does Emotional Intelligence Influence Salesperson Adaptive and Proactive Performance? *European Management Review*, Vol. 12, Iss. 4, 2015, P.261-274.
- Bartlett, M.S. Tests of significance in factor analysis. *Journal of Psychology*, Vol.3, Iss. 2, 1950, P.77- 85
- Bortz, J., Doering, N. *Forschungsmethoden und Evaluation*, 2006, Springer, Heidelberg.
- Cattell, R.B. The scree test for the number of factors, *Multivariate Behavioural Research*, Vol. 1, Iss. 2, 1966, P.245-276.
- Hagen, A. F., & Amin, S. G. Company factors and women's career development in personal selling: A cross cultural study. In *Annual Meeting of the Decision-Science-Institute* Vol. 1, 1997, P.315-317. San Diego: Decision Sciences Institute.
- Horn, J.L. A rationale and test for the number of factors in factor analysis, *Psychometrika*, Vol.30, 1965, P.179-185.
- McFarland, R. G., Rode, J. C., & Shervani, T. A. A contingency model of emotional intelligence in professional selling. *Journal Of The Academy Of Marketing Science*, Vol. 44, 2016, P.108-118.
- Rice, J., *Mathematical Statistics and Data Analysis*. Belmont, CA: Brooks/Cole Cengage Learning., ISBN 978-0534-39942-9, 2007, P. 138
- Shannahan, R. J., Bush, A. J., Shannahan, K. J., & Moncrief, W. C. How salesperson perceptions of customers' pro-social behaviors help drive salesperson performance. *Industrial Marketing Management*, Vol.51,Iss. 2, 2015, P.110-114.

Thompson B., Daniel, L.G. Factor analytic evidence for the construct validity of scores: a historical overview and some guidelines, Educational and Psychological Measurement, Vol. 56, 1996, P.197-208

Contact

Elena Rihova

Skoda Auto University, o.p.s.

Ekonomická 957, 1400 00 Prague 10, Czech Republic

elena.rihova@savs.cz

David Riha

University of Economics, Prague

W. Churchill Sq. 4 130 67 Prague 3 Czech Republic

david.riha@vse.cz

Michael Stross

University of Applied Sciences and Arts of Southern Switzerland (SUPSI)

Fernfachhochschule Schweiz, Ueberlandstrasse 12, 3900 Brig, Switzerland

michael.stros@ffhs.ch

Vladimir Zhechev

University of Economics – Varna

77 Knyaz Boris I Blvd. 9002 Varna, Bulgaria

Vladimir.zhechev@ue-varna.bg