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RESPONSIVENESS OF CULTURE-BASED SEGMENTATION OF ORGANIZATIONAL BUYERS

Veronika Jadczaková

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Abstract

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Much published work over the four decades has acknowledged market segmentation in business-to-business settings yet primarily focusing on observable segmentation bases such as firmographics or geographics. However, such bases were proved to have a weak predictive validity with respect to industrial buying behavior. Therefore, this paper attempts to add a debate to this topic by introducing new (unobservable) segmentation base incorporating several facets of business culture, denoted as psychographics. The justification for this approach is that the business culture captures the collective mindset of an organization and thus enables marketers to target the organization as a whole. Given the hypothesis that culture has a merit for micro-segmentation a sample of 278 manufacturing firms was first subjected to principal component analysis and Varimax to reveal underlying cultural traits. In next step, cluster analysis was performed on retained factors to construct business profiles. Finally, non-parametric one-way analysis of variance confirmed discriminative power between profiles based on psychographics in terms of industrial buying behavior. Owing to this, business culture may assist marketers when targeting more effectively than some traditional approaches.

B2B marketing, business culture, segmentation, psychographics, multivariate statistical techniques

In consumer markets the psychographic segmentation has received wide acceptance between both academists and practitioners since psychographics was proved to construct very vivid consumer profiles. As a result, such profiles – portraying the personality make-up of a consumer (Cahill, 2006; Wedel *et al*., 2003) – provided marketers with a solid departure point for adapting their communication style and selling tactics. Having recognized the discriminative power and usefulness of consumer psychographics, B2B marketers capitalized on this concept to trace organizational behavior. However, they limited the use of psychographics to characterize merely the individuals – purchase decision maker (Barry *et al*., 2009) or a CEO of small family-owned business (File *et al*., 1996) – regardless of an organization in which an individual works. It goes without saying, that such approach fails to describe big companies where personal objectives, driven by individual psychographics, are subordinated to the organizational objectives. Hence, this paper advocates using organizational psychographics emphasizing an organization as an entity rather than an individual.

Analogous to the definition of consumer segments *within which customers of similar needs are likely to exhibit similar behavior and hence to respond alike to the marketing mix* (Weinstein, 2004 p. 4), organizational psychographics is expected to capture the firm's mentality and build segments that are distinguishable from each other in terms of marketing mix preferences (Barry *et al*., 2009). In this sense, business culture is supposed to provide a necessary insight into the firm's unique personality and in doing so, create meaningful segments.

To date, the concept of business culture was discussed merely in the context of how to assess organizational performance and effectiveness (Garmendia, 2004), how to find best organization-person fit (Chatman, 1991) and in cross-cultural studies (Hofstede *et al*., 1993). However, to my knowledge, business culture as a segmentation tool has not been applied yet. Hence, it is the objective

of this study to critically examine to which extent organizational psychographics, that is, business culture, allows for separation of segments with regard to the industrial buying behavior.

MATERIALS AND METHODS

To recall, the paper works on the assumption that business culture as a psychographic dimension has a merit for segmentation and therefore, it allows for explanation of different styles of industrial behavior[1]. However, it has been proved that if the researcher wishes to compare between cultures, he shall do so within one industry since cultures of different industries are likely to vary more than cultures of one industry (Chatman *et al*., 1994). The logic behind this statement is that firms occupying the same industry face similar opportunities and risks, work on similar tasks and apply similar decision-making processes.

Owing to this, the paper will follow the concept of two-stage segmentation model suggested by Wind and Cardozo (1974). The rational of this model lies within forming of general macro-segments (e.g. according to industry, size, geographic location and others) first, within which the final micro-segments, possessing much more specific characteristics, are built afterwards. In short, the micro-segments are homogeneous groupings of firms found within a macro-segment. In this paper, the macro-segments will be defined along the type of industry which Chatman and Jehn (1994) believe to be reflected in a technology a firm applies. According to these authors culture defines the rules of how things are done in a company, that is, the technology which in turn is one of the most salient characteristics of an industry. It follows, that differences in cultures will result in differences in used technologies and such cultures will be found in different industries.

Hence, the classification of technologies will be pursued in order to classify the industry type – the macro-segment (Thompson, 1967). The micro-segments then will be characterized by organizational psychographics centering on the concept of business culture. For this purpose, the extended model of competing values (Desphandé *et al*., 2004) served as a platform for the selection of relevant variables measuring the business culture. The theory of competing values of organizational cultures was first proposed by Desphandé *et al*., (1993) and 11 years later modified by additional variables (market orientation, innovativeness and climate) extending the original concept of business culture. The motivation behind extending the model lied in the necessity to grasp a complexity of business behavior having not been covered fully within the former concept (Desphandé *et al*., 2004).

For the purpose of this paper, the sample of 278 manufacturing firms (defining the macro-segment) was analyzed. The data were gathered in the framework of the Centre of Research into the Competitiveness of the Czech Economy at the Faculty of Economics and Administration at the Masaryk University in cooperation with the market research firm Augur Consulting. Sample was taken out from population using quota sampling to ensure representativeness with respect to territory, industry, size (companies with at least 50 employees or 50 mil. CZK turnover) and legal form. The sample amounted to 10% of the entire population and was gathered by means of structured questionnaires. Variables on business culture were selected in a way to have relevance for marketing strategy. When interrogating, firms were asked to fill in the questionnaire from the viewpoint of the organization has with respect to other companies of the same industry.[2]

A response pattern of 19 statements measured on a 5-point scale (where '5' stands for a high level of given factor and '1' for a low level of given factor) was first analyzed using histograms to reveal a degree of skewness and kurtosis. Even though histograms indicated that some variables are non-normal, an inborn characteristics of a 5-point-scaled data, the items were not subjected to transformations since Pearson correlation coefficient is generally robust towards violations of normality (Pearson, 1931 and 1932; Hair *et al*., 2010). The overall sampling adequacy of the correlation matrix was examined through Kaiser-Meyer-Olkin (KMO) measure with value 0.5 as a bare minimum (Kaiser, 1970). KMO represents a ratio of the sum of squared correlations to the sum of squared partial correlations. In order the correlation matrix can be factorable, this measure shall be as large as possible with partial correlations approaching zero. KMO can be likewise calculated for individual variables produced on the diagonal of the anti-image correlation matrix. Here, all variables with value below 0.5 shall be considered for deletion. Next, Bartlett's measure tests whether original correlation matrix is significantly ($P < .05$) different from identity matrix and thus indicating substantial correlations between variables.

A set of 19 statements was then factor-analyzed through factor analysis (method of extraction: PCA, method of rotation: Varimax) to uncover underlying cultural traits. In doing so, the cut-off point for minimum level of factor loadings was set to 0.4 (Hair *et al*., 2010). The extraction was performed by Kaiser criterion requiring eigenvalue to be at least

1 Industrial buying behavior was measured on the following set of variables: product price, product quality, payment conditions, delivery conditions, supplier's spent years in business, other suppliers' references, supplier's quality certificate and supplier's behavior in compliance with CSR

2 Since the data were secondary, please see exact description of the data collection process, determination of target population, its comparison with respect to quotas and final sample size adjustments in Blažek *et al.* (2007).

1 (Nunally, 1967). Regarding the sample to variable ratio, it is customary to keep a minimum value 5:1 (Hair *et al*., 2010) which was highly outperformed here (278 cases, 19 variables).

In the next step, the extracted factors – more specifically factor scores based on Anderson-Rubin method – were taken forward to agglomerative hierarchical cluster analysis. Tabachnick and Fidell (2007) recommend Anderson-Rubin method if a researcher prefers uncorrelated factors. Since multicollinearity is a concern in cluster analysis (acts as weighing), proposed factor score method served best the criterion. In cluster analysis proximities between objects (here firms) were based on squared Euclidean distances and proximities between groups on Ward's algorithm. The dendrogram revealed then how many clusters should come into play for k-means partitioning technique – generating the final cluster solution. A one-way analysis of variance was carried out to assess whether factors discriminate between clusters sufficiently.

Ultimately, non-parametric Kruskal-Wallis test assigned predictive validity of the final cluster-solution, that is, whether clusters differ with regard to the industrial buying behavior.

RESULTS AND DISCUSSION

Recall, factor analysis shall reveal underlying dimensions centering on the concept of business culture. Prior to factor extraction, correlation matrix was first evaluated for the sampling adequacy by means of the KMO measure, the anti-image correlation matrix and the Bartlett's test. In this respect, the overall sampling adequacy was met (KMO equals to 0.694). Regarding the sampling adequacy for the individual variables, the main diagonal of the anti-image correlation matrix (see Tab. I) was inspected. Here, only one variable *x16a_other_costs* with value 0.491 was below the commonly used threshold. Since the value is very close to the acceptable limit 0.5, this variable was retained for the further analysis. In addition, significant (at P = 0.000) Bartlett's test of sphericity (H0: correlation matrix is identity matrix) confirmed substantial correlations, a crucial point for the factor analysis.

Having concluded factorability of the correlation matrix, PCA allowed for the extraction of seven latent constructs out of 19 manifest variables, accounting for 57.4% of the initial variance (see Tab. II). In other words, by retaining almost one third of the initial solution, PCA captured almost 60% of the information.

Since PCA solution rarely arrives at simple structure, component matrix was subjected to the rotation facilitating the of factor loadings (Tab. III). Interpretation follows groupings of variables which load highly on respective factors. Accordingly, seven factors were named: corporate image & efficiency (factor 1), community & cooperation, external environment & competition (factor 2), human capital & innovation (factor 4), costs (factor 5), adjustment (factor 6) and product development (factor 7), respectively. Three out of seven factors, namely factor 1, 3 and 6, do share similar background with factors presented in the work of Garmendia (2004). Furthermore, it is obvious (see Fig. 1) that factors do emerge around dimensions with internal vs. external emphasis, dimensions indicating stability vs. innovation and last but not least, dimensions portraying cooperation vs. competition (Desphandé *et al*., 1993).

After interpreting factor loadings, factor scores served as an input for hierarchical cluster analysis. Having examined dendrogram along with agglomeration schedule (not attached due to excessive size of the dendrogram depicting 278 cases!) five clusters were considered as a starting point for the k-means technique. Difference between type profiles proved to be statistically different at 0.000 significance level (using robust test[3] based on Brown-Forsythe F-ratio) for all traits. It shall be noted, however, that such tests will point to significant differences each time since k-means generates clusters in a way to maximize between-cluster differences while minimizing within-cluster differences. Number of cases assigned to a respective cluster is presented then in Tab. IV.

Subsequently, final cluster centers measured on seven factors were plotted using bar chart (see Fig. 1). In what follows, the clusters will be examined by highlighting the major attributes and in doing so, it will be indicated which clusters (if any) overlap with cultural profiles found in the quadrat analysis proposed by Desphandé *et al*. (2004).

As it turns out, cluster '1' (the Porter-type) involves matured, leading businesses primarily focused on building a good reputation along with sustainable competitive advantage – most likely due to low bargaining power of suppliers/buyers and barriers to entry limiting the scope of competitive rivalry, and thus allowing for above-normal financial returns. This cluster signifies firms with stabilized multi-oriented culture binding all factors into a strong cohesive corporate image.

High cost-burden is that what typifies cluster '2' (equivalent to a bureaucratic type) where rigidity and avoidance of anything new dominates this type of culture. Apparently, this cluster strives after control at the expense of human capital development, innovation and business itself. Formalization, conservatism and consistency are typically valued in this culture.

Cluster '3' (equivalent to a competitive type) likewise incurred large cost-disadvantage, however, keeps investing into product development. Despite

3 Not assuming homogeneity of variance (Levene's test was significant) and equal sample sizes

I: *Anti-image Correlation Matrix*

	x12a	x13a	x14a	x15a	x16a	x17a	x18a	x19a	x20a	x25a	x28a	x29a	x30a	x31a	motivation employees	stake-holders	x26a	x27a	x35a
x12a	**.745**[a]	–.162	.003	.020	–.073	–.020	–.084	–.079	–.168	–.048	–.145	–.090	.051	–.014	.007	.038	.039	.051	.059
x13a	–.162	**.678**[a]	–.143	–.062	.039	–.030	–.223	.107	.069	.018	–.003	.157	.015	–.062	–.058	–.023	–.065	–.005	–.059
x14a	.003	–.143	**.744**[a]	.008	–.079	–.174	–.081	–.225	–.298	–.020	–.011	–.027	.117	.070	.021	–.157	.007	–.007	.017
x15a	.020	–.062	.008	**.577**[a]	–.358	–.193	–.091	–.006	.062	–.005	–.157	.019	.118	–.119	–.057	.035	.085	.088	.049
x16a	–.073	.039	–.079	–.358	***.491***[a]	–.036	.114	.004	–.124	–.080	.143	–.068	–.081	–.014	.120	.029	–.015	–.030	.025
x17a	–.020	–.030	–.174	–.193	–.036	**.785**[a]	–.058	–.005	–.131	.074	–.020	.014	–.101	.066	–.153	.055	–.033	–.128	–.042
x18a	–.084	–.223	–.081	–.091	.114	–.058	**.794**[a]	–.103	–.118	–.032	–.013	–.078	.026	–.067	–.050	–.084	.121	–.073	–.017
x19a	–.079	.107	–.225	–.006	.004	–.005	–.103	**.794**[a]	–.127	–.070	–.019	.016	–.043	–.157	–.144	–.027	.020	.050	–.009
x20a	–.168	.069	–.298	.062	–.124	–.131	–.118	–.127	**.746**[a]	.111	–.077	.134	–.138	.056	–.029	.065	–.024	–.059	–.110
x25a	–.048	.018	–.020	–.005	–.080	.074	–.032	–.070	.111	**.569**[a]	–.010	–.122	.011	–.006	–.032	–.025	–.313	–.057	.055
x28a	–.145	–.003	–.011	–.157	.143	–.020	–.013	–.019	–.077	–.010	**.761**[a]	–.011	–.010	–.176	–.132	–.050	–.019	–.019	–.089
x29a	–.090	.157	–.027	.019	–.068	.014	–.078	.016	.134	–.122	–.011	**.600**[a]	.021	.094	–.025	–.035	–.095	–.012	.036
x30a	.051	.015	.117	.118	–.081	–.101	.026	–.043	–.138	.011	–.010	.021	**.590**[a]	–.391	–.064	–.130	.017	.044	–.006
x31a	–.014	–.062	.070	–.119	–.014	.066	–.067	–.157	.056	–.006	–.176	.094	–.391	**.625**[a]	.066	–.083	–.023	–.002	–.037
motivation employees	.007	–.058	.021	–.057	.120	–.153	–.050	–.144	–.029	–.032	–.132	–.025	–.064	.066	**.762**[a]	–.093	–.001	.045	–.030
stakeholders	.038	–.023	–.157	.035	.029	.055	–.084	–.027	.065	–.025	–.050	–.035	–.130	–.083	–.093	**.699**[a]	–.018	–.148	.013
x26a	.039	–.065	.007	.085	–.015	–.033	.121	.020	–.024	–.313	–.019	–.095	.017	–.023	–.001	–.018	**.550**[a]	–.140	–.038
x27a	.051	–.005	–.007	.088	–.030	–.128	–.073	.050	–.059	–.057	–.019	–.012	.044	–.002	.045	–.148	–.140	**.573**[a]	.028
x35a	.059	–.059	.017	.049	.025	–.042	–.017	–.009	–.110	.055	–.089	.036	–.006	–.037	–.030	.013	–.038	.028	**.746**[a]

a. Measures of Sampling Adequacy for individual variables

II: *Total Variance Explained*

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.161	16.635	16.635	2.190	11.526	11.526
2	1.611	8.478	25.113	1.676	8.820	20.347
3	1.523	8.015	33.128	1.563	8.228	28.574
4	1.347	7.088	40.216	1.469	7.732	36.306
5	1.157	6.088	46.305	1.433	7.540	43.846
6	1.070	5.633	51.937	1.431	7.533	51.379
7	1.033	5.438	57.375	1.139	5.997	57.375

Extraction Method: Principal Component Analysis.
Rotation method: Varimax
Kaiser criterion

III: *Rotated Component Matrix*

Manifest Variables	Rotated Components (Factors)						
	1	2	3	4	5	6	7
	corp. image & efficiency	community & cooperation	ext.environ. & competition	human cap. & innovation	costs	adjustment	product development
x14a_product quality	.748						
x20a_brand of company	.746						
x17a_qualification of employees	.557						
x19a_access to financing sources	.550						
x31a_support from local officials		.787					
x30a_support from state officials		.783					
mean_stakeholders_owner		.452					
x26a_bargaining power of customer			.771				
x25a_competiteveness			.728				
x29a_corruption			.446				
x27a_bargaining power of suppliers			.401				
x28a_interest in working in a comp.				.548			
mean_impact on motivation of employees				.505			
x12a_innovation				.482			
x16a_other costs					.764		
x15a_labor force costs					.752		
x13a_flexibility						.787	
x18a_customer care						.537	
x35a_market of products							.744

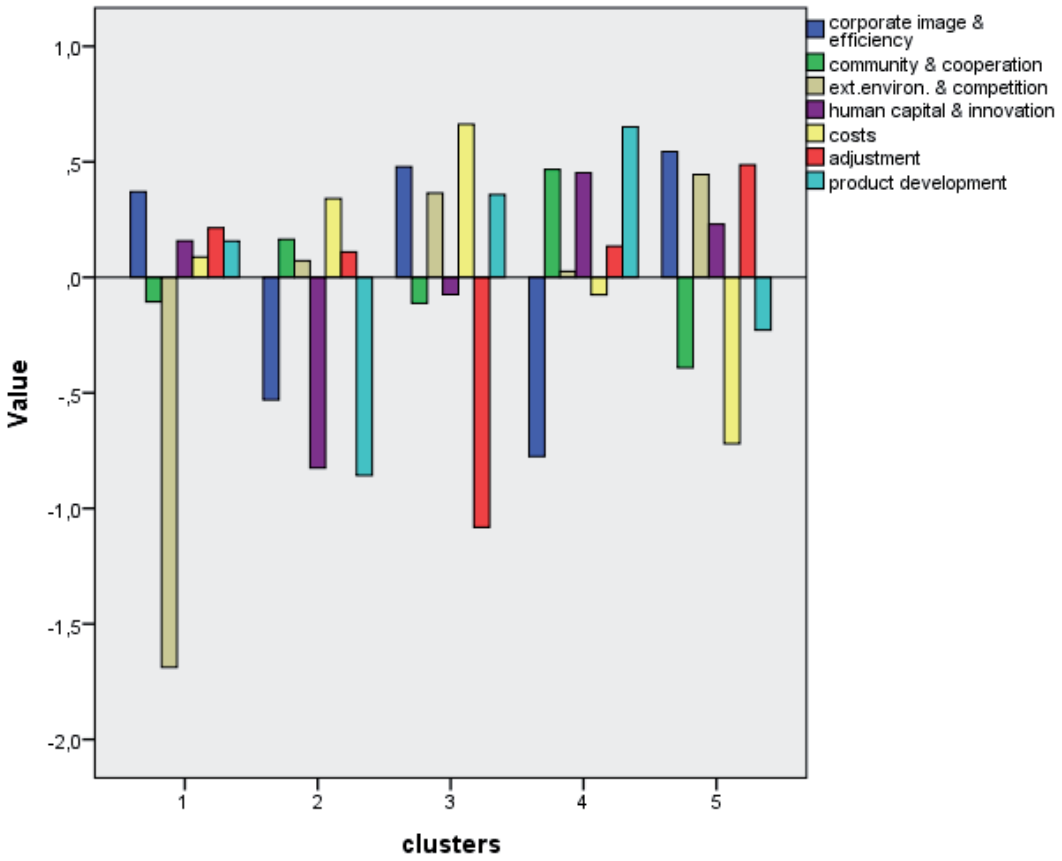
Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Factor loadings lower than 0.4 were suppressed.

IV: *No. of Cases in each Cluster*

Cluster	1	34
	2	56
	3	53
	4	62
	5	73
Total		278

a weak adjustment capability, focus on delivering quantifiable results, cultivation of self-image and demonstrated support for efficiency enables this segment to survive in the industry. Reluctance over flexibility, performance over people and competition over cooperation are qualities fostered in this type of environment.

Companies that embrace a social, traditional, well-established culture in cluster '4' (equivalent to a consensual type) draw its strength from



1: *Bar Chart depicting distribution of factors on Y-axis across clusters on X-axis*

V: *Kruskal-Wallis test*

	product price	payment conditions	delivery conditions	product quality	supplier's quality certificate	supplier's years in business	other suppliers' references	supplier's behavior in comp. with CSR
Chi-Square	7.223	9.826	8.341	7.010	12.045	7.991	2.909	12.316
df	4	4	4	4	4	4	4	4
Asymp. Sig.	.125	.043	.080	.135	.017	.092	.573	.015

Grouping Variable: Cluster Number of Case

collaborative efforts of all stakeholders to accomplish common objectives. This type of culture builds on healthy and trusting relationships among the staff that seemingly produce creative output. This culture encourages employees to come up with innovative ideas, be helpful to customers and ready for changes. Open-door policy, solidarity and progress are values commonly shared in this cluster.

Cluster '5' (equivalent to an entrepreneurial type) is unlike the typical go-getter, aggressive, risk-taking, changes anticipating, client-oriented segment with future-forward posture. Under economies of scale, this culture is intended to effectively drive behaviour towards desired results and market superiority. The entrepreneurial cluster recognizes trends as they occur, faces market challenges and adjusts accordingly. In doing so, dynamism, innovation and strong orientation on efficiency are central strategic priorities.

In order marketing strategy can "strike a chord", it does not suffice to form significantly different segments (satisfying *identifiability* criterion according to Wedel *et al.* (2003); MacDonald *et al.* (1995)). Firms within segments are likewise expected to behave similarly when making purchase decisions, and thus responding in the same manner to marketing stimuli (satisfying *responsiveness* criterion (Wedel *et al.*, 2003; MacDonald *et al.*, 1995)). Thus, when a researcher succeeds in identifying heterogeneous and responsive segments, marketers can propose a sound strategy and tailor their offerings to the specific needs of such segments. Therefore, a five-cluster solution shall be evaluated for a predictive validity as well. For this purpose, Kruskal-Wallis test was used. As demonstrated in Tab. V., clusters exhibit distinctive patterns of behavior ($P < .10$) regarding payment and delivery conditions, supplier's quality certificate, supplier's spent

years in business and supplier's behavior in compliance with CSR[4]. Though product price and quality does not discriminate between segments at a proposed level of significance, they still may be regarded when targeting since their p-values (0.125 and 0.135 respectively) may still be of a practical importance. Nevertheless, clusters seem to be rather invariant with regard to references of other suppliers.

CONCLUSION

As demonstrated, this paper confirmed earlier findings of Barry *et al.* (2009) and Verhallen *et al.* (1998) who validated contribution of psychographics in predicting industrial buying behavior. Moreover, this paper introduced a new segmentation base originated in the concept of business culture being capable of forming segments which are identifiable and responsive at once. Bearing this in mind, marketers can rely on psychographics when targeting by focusing only on those stimuli (as presented in Tab. V.) being truly relevant for customers. This will not only save time and money invested in a marketing strategy but will create satisfied participants on both extremes of the continuum of the buyer-seller relationship.

SUMMARY

As this paper manifested, culture penetrates through firms as does personality through an individual in consumer psychographics. In this sense, business psychographics is expected to grasp psychological motives to which the firms appeal. Owing to this, marketers can better relate needs of business segments to marketing stimuli and by doing so deliver service which is more in line with those needs. Assuming complexity of the buying centre and more formula-driven buyers than in a consumer sector, marketers can no more rely on personal psychographics. For this reason, business culture is believed to provide a valuable insight in functioning not only of an individual – the organizational buyer but of the organization as a whole. It follows, that by targeting the buyer, being of course influenced by the business culture, marketers indeed target the whole organization. Hence, it was the objective of this paper to introduce business culture as a new segmentation dimension for a B2B realm and to prove its usefulness for a marketing strategy.

For this purpose, the concept of Desphandé *et al.* (2004) centering on business culture was applied in a selection of the sound variables. A representative sample of 278 Czech firms from a manufacturing industry was then subjected to factor analysis (with PCA as a method of extraction and Varimax as a method of rotation), hierarchical clustering, k-means, one-way analysis of variance and Kruskal-Wallis test, respectively. First the sample was evaluated for appropriateness of correlation matrix through KMO measure, anti-image correlation matrix and Bartlett's test. Having concluded factorability of the correlation matrix, PCA (applying Kaiser's rule) extracted seven factors out of 19 manifest variables. By doing so, almost 60% of information was reproduced. Varimax facilitated then interpretation of factor loadings. In the next step, hierarchical cluster analysis was performed on factor scores to determine the *k*-number of clusters – being used as a departure point for the k-means clustering algorithm. As a result, 5 clusters were formed. Those were first tested on a discriminative power by means of one-way analysis of variance. Kruskal-Wallis test subsequently validated the 5-cluster solution with respect to industrial buying behavior.

As illustrated, business psychographics implementing business culture into its concept has merit for B2B segmentation. Therefore, this study encourages academists and practitioners to shift from observable to unobservable bases and explore the usefulness of business psychographics to its full potential.

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4 CSR stands for corporate social responsibility

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Address

Ing. Veronika Jadczaková, Department of Demography and Applied Statistics, Mendel University in Brno, 613 00 Brno, Czech Republic, e-mail: veronika.jadczakova@mendelu.cz