MENDEL UNIVERSITY IN BRNO

DEPARTMENT OF STATISTICS AND OPERATION ANALYSIS

Evaluation and Analysis of Questionnaire Lifestyle Segmentation

Diploma Thesis

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I declare I have worked up my Diploma Thesis on my own and have involved all quotations and used sources in list of references.

Brno, May 28, 2010 ……

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Abstract

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The thesis is concerned with market segmentation in terms of consumer lifestyle, values, attitudes and demographics. First and foremost, theoretical background attempts at outline of prevailing conceptual issues in psychographic research. Next, methodological section describes sequence of steps to be pursued when conducting a marketing research and last but not least, provides a theoretical treatment of techniques assessing variability between data. Final chapters demonstrate the practical use of psychographic information by means of relevant multivariate statistical methods, its organization within positioning maps, targeting and possible projection into advertising message.

Keywords: lifestyle, psychographics, marketing research, multivariate statistical methods, manifest variables, latent variables, segmentation, positioning, targeting.

Abstrakt

Jadczaková V. *Statistické vyhodnocení dotazníku – segmentace životního stylu.*
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Práce se zabývá segmentací trhu na základě životního stylu, hodnot, postojů a demografické informace spotřebitele. V první řadě se teoretická část zaměřuje na vytyčení současných konceptů v oblasti psychografického výzkumu. Metodologie následně popisuje sled kroků při provádění marketingového výzkumu a uvádí statistické techniky sloužící k posouzení variability dat. Závěrečné kapitoly demonstrují praktické využití psychografické informace za pomocí relevantních vícerozměrných statistických metod, její organizaci v rámci polohovacích map, zacílení a možnou projekci do obsahu reklamního sdělení.

Klíčová slova: životní styl, psychografie, marketingový výzkum, vícerozměrné statistické metody, pozorované proměnné, latentní proměnné, segmentace, zacílení, pozicování.

CONTENT

LIST OF ABBREVIATIONS

ACORN A Classification Of Residential Neighborhoods
AIC Akaike Information Criterion
AID Automatic Interaction Detector
AIO Activities, Interests, Opinions
ALO At-least-one
ANN Artificial Neural Network
BIC Bayesian Information Criterion
CART Classification and Regression Tree
CCA Centre de Communication Avancé
CCC Chinese Cultural Connection
EFA Exploratory Factor Analysis
IRS Item Response Theory
LCA Latent Class Analysis
LOV List of Values
MCA Multiple Correspondence Analysis
MDS Multidimensional Scaling
MML Market Media Lifestyle
NS-SEC National Socio-Economic Classification
PAF Principal Axis Factoring
PCA Principal Component Analysis
PRIZM Potential Rating Index for ZIP Markets
RVS Rokeach Value Scale
SEM Structural Equation Modeling
SVI Schwartz Value Inventory
TG Target Group
TGI Target Group Index
VALS Values, Attitudes, Lifestyles

PART I: INTRODUCTION

"Nothing can be more challenging than trying to predict the future, nor more daring than relying on predictions of the future" (Kahle, et al., 1997). Yet, every human being is steadily occupied by making plans about future. Marketers and researchers argue that in order to be capable of making predictions about future one must first handle the concept of today (and of yesterday). And, in doing so, one must likewise be acquainted with what compromises that concept (Demby, 1974) in terms of way we live and spend money, what we think and believe, the values we hold, and most importantly how we purchase and consume. If we substituted all these concept variables by a single one we would have to refer to such newly obtained variable as *lifestyle* (Kahle, et al., 1997).

Lifestyle

Lifestyle does not seem to have a universally accepted definition. One author defines lifestyle as "*an exhibited set of shared values of tastes*" (Solomon, 1994 p. 621). Another one brings more conventional definition that "*lifestyle is the manner in which people conduct their lives, including their activities, interests, and opinions*" (Peter, et al., 1994 p. 463). Following authors denote lifestyle more in general terms, namely, as the way *"how one lives"* (Hawkins, et al., 1989 p. 393) or as *"actual pattern of behavior"* (Solomon, et al., 1997 p. 26). Here, if we reformulate the latter, that is, lifestyle accounts for behavior then in market context consumer lifestyle would account for consumer behavior. Collectively, under assumption we know all variables compromising our today-lifestyle-concept, and under assumption consumer behavior is function of consumer lifestyle, we can conclude that consumer behavior may be subjected to measurement. Technique aiming at measurement of lifestyle concept is commonly known as *psychographics*.

Psychographics

After its introduction by Emanuel Demby, a marketing researcher, in 1970s psychographics (and lifestyle) have received wide attention among theorists and practitioners (Weinstein, 2004). Even though both terms have been used interchangeably in marketing literature some authors distinguish among the construct – lifestyle and its operationalization – psychographics (Wedel, et al., 1998).

Psychographics is defined as „*a way of describing (graphics) the psychological (psycho) makeup or lifestyle of a consumer or segment of consumers*" (Hawkins, et al., 1989, p. 402). In addition to personality traits and lifestyle, Demby pinpoints other variables determining how the market is segmented – sociological factors, anthropological factors and self-concept (Weinstein, 2004).

However, proponents of lifestyle research generally rely on additional non-lifestyle dimensions such as demographics since they believe to develop more comprehensive

consumer portrayals which enhance delivery of products and services more in line with consumers' needs (Hawkins, 1989; Kahle, 1997).

In sum, psychographics attempts to capture cognitive[1] representation of lifestyle relevant consumption patterns and to analyze how these representations relate to purchase behavior (Solomon, et al., 1997). Based on the analysis of purchase behavior through psychographic segmentation techniques researchers construct lifestyle categories – lifestyle segments (e.g. Wells, 1975)

Lifestyle Segmentation

Market segmentation, coined by Wendell Smith in 1960s, shall possess following definition: *„market segmentation is the process of splitting potential customers into groups (segments), within which customers with similar needs and characteristics are likely to exhibit similar purchase behavior. By doing this, each segment can be addressed with a distinct marketing mix"* (MacDonald, et al., 1995 p. 10; Weinstein, 2004 p. 4). Logically, in lifestyle segmentation context groupings are built on similar lifestyle characteristics.

Regarding the historical shift from traditional social communities to pure consumption communities accompanied by the product explosion in 1990s marketers seek to communicate not with an entire population, but with the most attractive segments – targets (e.g. Fennell, 1997). In this sense, lifestyle segmentation is believed to provide more complex tool for targeting since it visualizes segments through very colorful consumer typologies (syndicated or customized). Furthermore, marketing communication has been shown to be more effective when consumer typologies are understood and reflected in the content of message (Chiagouris, 1991). In order to create those colorful consumer profiles lifestyle segmentation fully relies, for instance, on techniques of factor and cluster analysis.

Factor and Cluster Analysis

Both post-hoc methods refer to multivariate statistical techniques frequently employed in lifestyle segmentation studies. Please note that this part of thesis provides just non-technical overview.

Factor analysis explains variability among large number of variables by reducing them to smaller number of key variables called factors. The aim of variables reduction is better explanation, and hence understanding of given marketing situation (Weinstein, 2004).

Cluster analysis uses grouping techniques which form groups of related variables remaining homogenous within and heterogeneous between segments. The aim of cluster analysis is to create segments exhibiting similar purchasing behavior, and thus being exposed to the same basket of marketing mix (Weinstein, 2004).

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[1] Cognition refers to information processing based on individual psychological functions. It is a process of applying knowledge, changing preferences, and thus learning how to respond to same stimuli for second time.

Structure of Thesis

Chapters and sub-chapters are grouped by editorial content into three main parts (beginning with signature "III"):

Part III: Conceptual Framework

This section deals with theoretical issues in psychographic research divided into lifestyle concept and segmentation concept. The former introduces lifestyle as a segmentation variable, the latter outlines seven substantial steps to be pursued when conducting a market segmentation.

Part IV: Methodology

This section decomposes a market research into sequence of steps, from formulation of research objectives, over demonstration of statistical methods, to the presentation of research proposal.

Part V: Results and Interpretations

The fifth part is devoted to the application of statistical methods in real settings of questionnaire data, namely to factor analysis, cluster analysis, contingency tables and multidimensional scaling. Findings of methods are subsequently commented and projected in the two-dimensional plane, denoted as positioning map.

Based on results from preceding part chapter 14 "Marketing Implementation" attempts at its translation into advertising message that shall be communicated to the target market. Finally, the research objectives set in part IV are to be verified.

Ultimately, discussion intends at outline of possible extensions for future research and conclusion at recapitulation of all preceding chapters.

PART II: OBJECTIVES

Objective of my thesis is to establish segments of Czech apparel market (TG: women) in terms of consumer lifestyle, values, attitudes and demographics. The main purpose of this segmentation base is to obtain a better understanding of the consumer as a person by measuring his psychological dimensions as well as way how s/he lives. Such approach provides more lifelike portrayal of consumer which facilitates its translation into marketing activities more effectively.

For that purpose, questionnaire data from 8050 respondents, supplied by market research firm Median, s. r. o., will be analyzed and evaluated. By doing this, 81 psychographic and 8 demographic variables will be subjected to factor analysis, cluster analysis, contingency tables and multidimensional scaling, respectively. Results will be then projected in two-dimensional positioning maps, the most involved market within apparel industry will be targeted and ultimately, advertising message to be communicated will be suggested.[1]

[1] For further reference on thesis objectives see PART IV, chapter 4: Research Objectives.

PART III: CONCEPTUAL FRAMEWORK

Conceptual framework splits the topic of this thesis, *Lifestyle Segmentation*, into lifestyle concept and segmentation concept. The former explores the independent, dependent, and intermediary variables and their roles within consumption process. The latter deals with formulation of segmentation criteria crucial for effective segmentation and outlines segmentation process in seven steps. Furthermore, the segmentation concept overviews related theories focused on proposed segmentation bases, methods and typology systems.
The target of this part is to design preferred approach towards lifestyle segmentation serving then as baseline for the further step – methodology development.

1 LIFESTYLE

Specifically, this chapter is concerned in investigating of all variables determining consumer behavior, namely, lifestyle variables, self-concept variables, and intermediary variables. Their understanding is critical prior to application of relevant segmentation base, one of the first steps in segmentation process.

1.1 Nature of Lifestyle

Lifestyle concept has emerged from the fields of personality and motivational research (Freud, Maslow, Dichter) as a response to the need for more lifelike picture of consumers and a better understanding of their motivations (Wedel, et al., 1998). Hence, we can conclude that lifestyle campaign is built on those concepts and incorporates them fully in its syllabus. Therefore, personality traits[1] and motivations are core variables in a basket compromising among others variables such as demographics, social class, reference group, emotions, household life cycle, culture and past experience, having a direct influence upon lifestyle. Thus, if those independent-basket-variables stay on the left side of equation we need to assign to the lifestyle such variables accounting for the right side of that equation. Those variables are activities, interests, opinions, likes/dislikes, expectations, consumption and feelings, collectively termed as dependent variables (Hawkins, et al., 1989). In addition to lifestyle variables one shall allude to internal basis of the lifestyle, so called *self-concept* (discussed later).

AIO Concept

Let me be now more specific about three components of lifestyle variables, namely, *activities* (what we do in terms of work, hobbies, social events, vacation, clubs, shopping…), *interests* (what we want in terms of family, home, job, fashion, food, media, achievements…), and *opinions* (what we think in terms of oneself, social issues, politics, business, economics,

[1] Traits are personality characteristics bringing consistency in someone's behavior (Lastovicka, et al., 1997). Because of their stability in time traits are often subjected to measurement.

education, future, culture…), which are often made into the acronym AIO (Cahill, 2006). AIO is a methodology introduced into marketing research by William Lazer in 1963 which operationalizes (i.e. makes measurable) the lifestyle construct through a large battery of Likert-type statements (requiring respondents to indicate a degree of agreement or disagreement). Nevertheless, most AIO studies include additionally demographic variables.

The only drawback of this method is a large number, often 200 up to 300, statements. Therefore, a data reduction technique such as factor analysis is first applied to reduce the large battery of statements into a small number of more meaningful and interpretable psychographic dimensions (Wedel, et al., 1998).

1.2 Self-Concept

Self-concept can be defined as *"the totality of the individual's thoughts and feelings having a reference to himself as an object"* (Sirgy, 1982). In other words, personal self-concept presents attitudes, feelings, perceptions and evaluations one holds to himself. Hence, self-concept can be expressed as a image about myself which is believed to dictate specific behavior patterns (Mowen, 1990). Moreover, self-concept is shaped through social interactions with parents, peers, friends, reference group and significant others. As a result, one strives to achieve positive evaluation from others to who one aspires. Thus, self-concept refers to the manifestation of one's lifestyle (Hawkins, et al., 1989).

Self-concept items (attitudes, perceptions, feelings and evaluation) shall be seen in two dimensions, that is, in actual/ideal and private/social dimension. The actual/ideal distinction refers to actual and ideal perception of myself. The private self refers to how I see myself and social how others see me. Table 1 shows these relations.

TABLE 1: Dimensions of consumer's self-concept

	Actual self-image	**Ideal self-image**
Private self	How I actually see myself	How I would like to see myself
Social self	How others actually see me	How I would like others to see me

Source: Hawkins, et al., Consumer Behavior, 1989, p. 396.

Whereas, every individual tends to move from actual (private and social) towards ideal (private and social) self-concept (Hawkins, et al., 1989). Therefore, we frequently engage in behaviors such as product purchases when we think those purchases enhance the attainment of our ideal self-concept in both private and social dimension (Sirgy, 1985).

As marketing managers strive to develop new products or appeals for consumers they should bear in mind this important variable. Products which are perceived as expressive of self-concept (actual or ideal) are more likely to be purchased (Hawkins, et al., 1989).

1.3 Lifestyle and Consumption Process

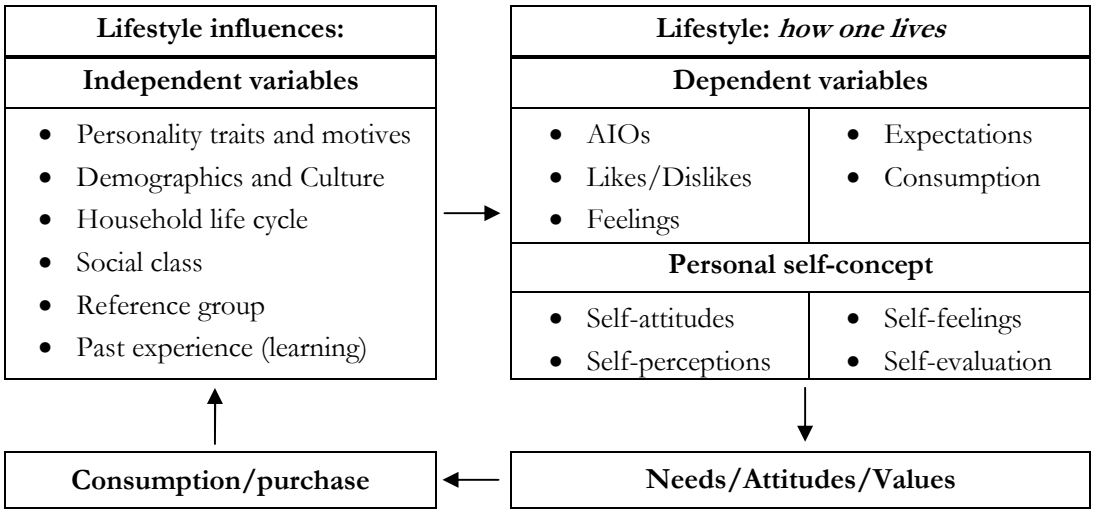
In this section I am going to present model of consumer behavior. This model reflects organization of all variables (variables influencing lifestyle, lifestyle variables and self-concept variables) determining consumer behavior (Hawkins, et al., 1989).

However, effect of these determining variables is transmitted through the intermediary variables – needs, attitudes, and values. I now discuss each of these variables in turn.

Attitudes are positive or negative standings toward various persons, objects, ideas, or situations. (Lu, 2008 p. 34). *Values* are according to Maslow essentially equivalent to *needs* and they are hierarchical in nature (he used values and needs interchangeably). Other authors clarify values as more enduring than attitudes and thus occupying a more central position in our cognitive system. Therefore, values shall be determinants of attitudes and behavior and hence provide us with more stable and inner-oriented understanding of consumers (Homer, et al., 1988 pp. 638-646).

Figure 1 recaps all preceding chapters. To explain this model let me consider following analogy. Loose of job (demographics) can pose lifestyle changes in terms of consumption problems (lifestyle) and decreased self-evaluation (self-concept), either forming new attitudes towards purchases (spendings). Now, in attempt to maintain same consumption patterns one must avoid other spendings like vacation, membership in tennis club, social events etc. which brings about further lifestyle changes. Therefore, it is vital for managers to handle lifestyle concept and factors influencing it since consumers are ready to adopt new consumption patterns in attempt to maintain/reduce/enhance their lifestyles (Hawkins, et al., 1989).

FIGURE 1: Consumer behavior model[1]



Source: Adapted from Hawkins, et al., Consumer Behavior, 1989, p. 20.

[1] Please note, this model is not predictive, that is, it doesn't provide sufficient information with respect to the particular purchase of product/brand.

2 SEGMENTATION PROCESS

Segmentation process in its broader context means "*partitioning of customers into 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).

Following this definition, this section serves as a handbook making that definition enforceable by splitting the segmentation process into seven steps (Födermayr, 2006). In other words, this handbook provides segmentation framework which can assist managers when implementing segmentation in practice. Nevertheless, before doing that, we start first with the formulation of criteria vital for effective segmentation:

TABLE 2: Segmentation criteria

Identifiability	Segments should be recognized easily so that they allow for measurement.
Substantiality	Each segment should have sufficient size to be profitable enough.
Stability	Each segment should be relatively stable over time.
Actionability	Each segment should be easily communicated with distinctive promotion, selling and advertising strategy.
Accessibility	Each segment should be easily addressed through trade journals, mailing lists, Internet, industrial directories and other media.
Responsiveness	Each segment should differently respond (in terms of product/brand choice) to marketing mix.

Source: Adapted from Wedel, et al., Market Segmentation 2003, p. 16.; MacDonald, et al., Market Segmentation, 1995, p.11.; Weinstein, Handbook of Market Segmentation, 2004, p.39.

2.1 Market Definition

The first step in the process is the proper definition of the market. According to MacDonald & Dunbar (1995, p. 2) the market can be defined as: *"the aggregation of all the products that appear to satisfy the same need".* Building on this definition, Weinstein (2006) specifies market model consisting of three levels: the relevant market, the defined market, and the target market. *The relevant market* is the preliminary definition of market based on market scope (e.g. local, national, international…), product market and related generic market. Once relevant market is defined, we proceed to the next level, the defined market. The *defined market* includes assessment of penetrated market (existing customer base) and untapped market (noncustomers). At level three, we take "pre-segmented" definition and apply segmentation bases (discussed later) to identify segments. Then, from these segments we select target market, the final element of our model (Weinstein, 2004).

2.2 Segmentation Base Selection and Evaluation

This chapter classifies four segmentation bases. A conceptual overview of bases is provided and the available bases are evaluated according to the six criteria (described above).

A segmentation base is defined as: *"a set of variables or characteristics used to assign potential customers to homogenous groups"* (Wedel, et al., 2003 p. 7). That is, we decide who will be allocated to which group. Following Wedel, at al. (2003), we distinguish segmentation bases into *general* (independent of products/services/circumstances) bases and *product-specific* (related to the both the customer and the product/service/circumstance) bases. The next dimension of classification, distinguishes whether these bases are *observable* (i.e. measured directly) or *unobservable* (i.e. inferred) (Wedel, et al., 2003). Those distinctions are depicted in table 3.

TABLE 3: Classification of segmentation bases

	General	**Product-specific**
Observable	Cultural, geographic, demographic, socio-economic variables, postal code classifications, household life cycle, household and firm size and media usage	User status, usage frequency, store loyalty, brand loyalty, stage of adoption, situations
Unobservable	Values, personality and lifestyle	Benefits, perceptions, elasticities, preferences, intentions

Source: Adapted from Wedel, et al., Market Segmentation, 2003, p. 7.

The most widely used base is general observable, often simplified into one term *geo-demographics*. Geo-demographics acts under assumption that people living in neighborhoods and possessing same demographics tend to operate similarly (Cahill, 2006). The biggest advantage of this base consists in its ease of data collection exploiting municipal and business registers (combined with consumer surveys) resulting in stratified and quota samples. Segments are often readily accessible because of the wide availability of media usage profiles. The drawback lies in relatively low responsiveness and tendency to cluster neighborhoods rather than individual consumers (Wedel, et al., 2003).

Following base is general unobservable, however, frequently denoted as *psychographics*. The main purpose of this base is to obtain a better understanding of the consumer as a person by measuring his psychological dimensions as well as way how s/he lives. Such approach provides more lifelike portrayal of consumer which facilitates its translation into marketing activities more effectively (strong actionability). Nevertheless, implementation of these bases succeeds more in description of segments in terms of product use, media exposure, shopping behavior etc. than as direct formation of homogenous segments (Wedel, et al., 2003).

Specific observable base comprises variables related directly to buying and consumption behavior implying high responsiveness towards changing marketing mix. These bases employ as a main method of data collection household and store scanner panels and direct mail lists. Anyway, accessibility and actionability of the identified segments is limited in a view of the weak associations with general consumer descriptors (Frank, 1972).

Last class of bases involves variables which might be viewed as a chain of effects as each variable affects those preceding it (Wilkie, et al., 1977). *Perceptions* lack in stability as they are immediately affected by scrambling effects. *Benefits* people seek in products are highly responsive since they demonstrate strong differences in attitudes (Wilkie, 1970), thus enabling managers to target specific marketing strategies to chosen markets (actionability). *Intentions* are believed to be the strongest correlates to buying behavior, hence indicating high responsiveness (Wedel, et al., 2003).

Evaluation of Segmentation Bases

Table 4 summarizes four segmentation bases according to the criteria for effective segmentation reviewed previously. In general, most effective bases appear to be observable general and unobservable specific. Please note, however, that effectiveness of segmentation base is influenced by specific requirements of the study. Often, multiple segmentation bases are used to form segments since their combinations provide more vivid portrayal of the segment through which marketers can tap consumer targeting potential more confidently.

TABLE 4: Evaluation of segmentation bases

Bases/Criteria	**Identifi-ability**	**Substan-tiality**	**Stability**	**Action-ability**	**Accessi-bility**	**Responsi-veness**
General Observable	very good	very good	very good	poor	very good	poor
General Unobservable	moderate	good	moderate	good	poor	poor
Specific Observable	good	very good	good	poor	moderate	good
Specific Unobservable						
Perceptions	moderate	good	poor	good	poor	poor
Benefits	good	good	good	very good	poor	very good
Intentions	good	good	moderate	poor	poor	very good

Source: Adapted from Wedel, et al., Market Segmentation, 1998, p. 16.

2.3 Segmentation Method Selection and Evaluation

This chapter outlines current segmentation methods into four categories[1]. My purpose is to provide brief overview, rather than details of these methods, and to assign the most applied methods to the segmentation bases. In the final part of this chapter evaluation on their effectiveness will be addressed.

As in previous classification scheme segmentation methods can be defined within two dimensions. The first one distinguishes between *a priori* approach when the type and number of segments are determined in advance (i.e. before analysis) and *post hoc* approach when the type and number of clusters are determined on the basis of the results of data analysis (i.e. after analysis). The second way of classifying is according to whether *descriptive* or *predictive* methods are employed. Descriptive methods explain relationships across a single set of segmentation bases, with no distinction between dependent and independent variables. Predictive methods, on the other hand, explain relationships between two sets of variables, whereas one set consists of dependent variables being explained (predicted) by the set of independent (explanatory or predictor) variables (Wedel, et al., 2003). Table 5 illustrates these categories.

TABLE 5: Classification of methods used for segmentation

	A priori	**Post hoc**
Descriptive	Contingency tables, log-linear models	Clustering methods: non-overlapping, overlapping, fuzzy techniques, LCA, correspondence analysis, MDS and other mixture models
Predictive	Cross-tabulation, regression, logit and discriminant analysis, canonical correlation	AID, CART, Clusterwise regression, ANN, conjoint analysis, and other mixture models

Source: Adapted from Wedel, et al., Market Segmentation, 2003, p. 18.

Cross-tabulations deem to have been popular technique of segmentation, especially in early applications. However, the disadvantage of contingency tables is viewed in measuring associations among multiple segmentation bases since higher order interactions are difficult to detect and interpret in the tables. Therefore, several authors advocate the use of *log-linear models* for that purpose. The objective of these techniques may be seen in obtaining first insights

[1] Normative segmentation methods, using elasticities as segmentation variable, were not covered in the thesis as they satisfy just responsiveness criterion and largely neglect other criteria for effective segmentation (Wedel, et al., 2003). Microeconomic theory, however, suggests that segments shall be clustered on the basis of demand functions measuring relative change in demand in response to one-unit relative change in marketing mix variable, mostly price (Massy, et al., 1965).

about segments and relationships among segmentation bases, for instance, to compare heavy and regular users of a brand by lifestyle (Wedel, et al., 2003).

In a priori predictive methods, two-stage procedure is implemented. First, a priori segments are formed by using one set of segmentation bases (e.g. product-specific variables as brand loyalty), and then the profiles of segments are described along a set of independent variables (e.g. psychographic variables). That is, we first identify heavy users and then verify whether psychographics can discriminate between heavy and regular users[1]. *Discriminant analysis,* commonly applied in psychographic and product-specific approach is, however, method used to describe segments rather than to identify them (Wedel, et al., 2003).

Other methods, closely related to the product-specific measures of purchase behavior, are *regression* and *multinomial logit model*. The former derives mathematical equation measuring single dependent variables (e.g. product usage) based on two or more independent variables (Weinstein, 2004). Elasticities, for instance, are estimated by log-linear regressions. Potential of multinomial logit model lies in the area of response-based segmentation assuming that consumers are grouped into segments that are relatively homogenous in brand preferences and responses to causal factors (Wedel, et al., 1998).

Third category, post-hoc descriptive methods, subsumes *cluster analysis*, *latent class analysis*[2] *and multidimensional scaling*. In geo-demographics, first PCA is applied to uncover most pertinent consumer characteristics. In second stage, cluster analysis then executes the formation of final segments. In psychographics factor analysis is alike used to translate the large battery of AIO statements to a smaller number of more meaningful key factors which are then used as inputs in cluster analysis. Multidimensional scaling, also referred to as perceptual mapping, is a technique which graphically represents product attributes based on customers' perceptions and preferences for brands/products/service categories. The objective is to identify segments of customers with similar needs or attitudes toward products. (Wedel, et al., 2003).

Last category, the post-hoc predictive approach, exploits techniques of choice modeling – *conjoint analysis and clusterwise regression*. Conjoint analysis measures the impact of varying product attribute mixes on the purchase decisions. This approach ranks customer perceptions and preferences towards products. These are then evaluated and grouped for segment homogeneity (Weinstein, 2004). Clusterwise regression is a method for simultaneous prediction and classification. This method clusters subjects nonhierarchically in such a way that the fit of regression can be optimized. (Wedel, et al., 2003).

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[1] Forward approach of market segmentation

[2] LCA (latent class analysis) is generic name for exploratory factor analysis (employing techniques as PCA for instance) and confirmatory factor analysis (employing techniques as SEM for instance). It attempts to explain the observed associations between the factors that make up the table by introducing unobservable underlying classes (Goodmann, 1974).

Evaluation of segmentation methods

Table 6 summarizes the most applied methods which are then evaluated on their effectiveness for segmentation and prediction, on their statistical properties, on the availability of computer programs and on applicability to segmentation problems. Such overview shall serve as a handbook prior to the application of relevant methods.

TABLE 6: Evaluation of segmentation methods

Methods/Criteria	Segmentation effectiveness	Prediction effectiveness	Statistical properties	Applications known	Availability of programs
A priori descriptive					
Cross tabs	moderate	very poor	good	very good	very good
Log-linear models	moderate	very poor	very good	very good	very good
A priori predictive					
Regression	poor	very good	very good	very good	very good
Discriminant an.	poor	very good	very good	very good	very good
Post hoc descriptive					
Nonoverlapping	very good	very poor	poor	very good	very good
Overlapping	very good	very poor	poor	very poor	poor
Fuzzy	very good	very poor	poor	moderate	good
LCA	very good	poor	good	very good	good
MDS	very good	very good	good	moderate	poor
Post hoc predictive					
Conjoint an.	good	good	poor	good	moderate
Clusterwise regression	very good	very good	moderate	good	good

Source: Adapted from Wedel, et al., Market Segmentation, 2003, p. 29.

Based on results from the table the most effective segmentation methods seem to be those included in the post hoc predictive category. The selection of the right method, however, requires the same considerations as the selection of right segmentation base, that is, one shall take into account the special requirements of the study (under assumption that those requirements fit firms' resources and objectives).

To conclude, selection of segmentation base(s) and method(s) are two interrelated steps which implies that the right choice of relevant method is largely affected by the choice of segmentation base.

2.4 Segment Formation

The fourth step in segmentation process is the segment formation. In introductory part of this section we specified six criteria[1] each segment ought to meet. Nevertheless, DeSarbo (2003) believes that *feasibility* to develop marketing action for relevant segments, *projectability* of that action to entire market and increase in *profitability* of a firm shall be considered as other important criteria for effective segmentation. Finally, segments shall be formed in that way to stay homogenous within and heterogeneous between with regard to customer needs. Those criteria shall assist firms in segmentation process and shall help to deliver its products/services more in line with customer needs.

2.5 Profiling and Evaluation

The core of this chapter is engaged in profiling of formed segments. A conceptual overview of selected (and fundamental) typology systems in historical order is provided along with their allocation to the relevant segmentation bases. Those findings are subsequently summarized in a table and accomplished by additional most discussed and implemented typology systems.

Profiling can be defined as a practice of customer profiles construction, by assigning key characteristics to formed segments. In other words, profiling facilitates segment visualization and thus entails more confidential translation of those profiles into a marketing strategy. The output of profiling is then called *typology*.

Historical Perspective of Typology Systems

From historical standpoint the process of profiling for marketing purposes was launched in the 1950s by motivational research, typified by Ernst Dichter. Dichter pioneered Freudian emphasis on unconscious motivations that he believed to capture through projective techniques. In motivational atmosphere, another psychologist, Abraham Maslow, introduced his concept – *Maslow's Hierarchy of needs*[2] represented in the shape of pyramid with the most primitive (i.e. survival) needs at the bottom and the advanced need for self-actualization at the top. Maslow supposed that every individual is driven by the need to value what one lacks (Kahle, et al., 1997). Therefore, once certain level of need was fulfilled that value becomes subordinate and as a result one strives (i.e. is motivated) to achieve higher level of values.

Values as motives were likewise viewed by other theorists like Milton Rokeach, Lynn Kahle or Shalom Schwartz who suggested another instruments for value identification and measurement – *Rokeach Value Scale* (RVS), List of Values (LOV) and Schwartz Value Inventory (SVI), respectively.

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[1] Identifiability, substantiality, stability, actionability, accessibility and responsiveness.
[2] According to Maslow needs are essentially equivalent to values and hence he uses either terms interchangeably.

In the 1960s the decade of benefit segmentation came. The proponent of benefit segmentation Russ Haley stated that segmenting of consumers is done on rational benefits people seek in products (Kahle, et al., 1997).

The decade of segmenting consumers on more abstract levels as values and lifestyles came in the 1970s, commonly represented by VALS[1] (developed by Mitchell) in U.S. and Euro-Socio-Styles (developed by CCA) in Europe. Both concepts built its ideology on value orientation since they assumed that values are not subjected to quick changes over time and they are thus well suited for long-term strategic planning (Kofler, 2005). However, in either case, segmentation was solely based on those values and still not respecting any ties to the specific product.

PRIZM, ACORN and other geographic segmentation systems came into existence as well during this decade. The rationale behind these typologies is that people with same socio-demographic characteristics and lifestyles tend to aggregate in the same neighborhoods.

Following table demonstrates list of fundamental and modern typology systems assigned to the relevant segmentation bases.

TABLE 7: Typology systems

General observable	
Geo-demographics	PRIZM (1976), ACORN (1981), MOSAIC, GeoVALS, CAMEO, RDA Research (1987), Geo-Marktprofiel
Household lifecycle, socioeconomics	MacDonald & Dunbar (1995), SAGACITY (1981)
General unobservable	
Personality traits	Edward's personal preference schedule, Cattel (1970)
Values	Maslow (1954), RVS (1973), Hofstede (1980), LOV (1983), CCC (1987), SVI (1992)
Lifestyles	Euro-Socio-Styles (1972), VALS (1978), Sinus Milieus (1978), Experience-Milieus,
Specific observable	
Usage frequency	Twedt (1967)
Stage of adoption	Rogers (1962)
Situations	Belk (1975)
Specific unobservable	
Perceptions	Yankelovich (1964)
Benefits	Haley (1968)

To sum it up, after profiles to formed segments are assigned, then these segments will be evaluated according to the criteria for effective segmentation. Ultimately, based on profiling and evaluation, target segments have to be selected.

[1] The original VALS spawned from Maslow's pyramid of needs and RVS.

2.6 Selection of Target Markets

By targeting we understand selection of segment(s) a firm is going to serve by differentiated marketing mixes. The choice of number and type of segments is highly affected by strategy a firm wants to pursue (e.g. Jobber, 2004). The firm can either target two or more segments (*differentiation*) or just one segment (*concentration*) or in extreme case, every single customer (*atomization*[1]) (Weinstein, 2004).

Obviously, differentiated treatment of segments often imposes new product/service offerings, several promotional campaigns, channel development, and additional expenses for implementation and control. On the other hand, targeting means limited waste and improved marketing performance through "tailored" marketing mixes (Weinstein, 2004).

2.7 Marketing Mix Planning Decisions

Once the decision about target market(s) is taken, managers need to elaborate marketing mix (4 P's) in a way that matches different needs of segments. In doing so, each segment ought to satisfy *responsiveness* criterion to be homogenous and unique in its response towards marketing mix. In this case only the effectiveness of any segmentation strategy will be achieved. (Wedel, et al., 2003). Table 8 exemplifies these marketing mix decisions managers shall design/refine.

TABLE 8: Marketing mix planning decisions

Product	**Place**
A. New product development	**A.** Channel decision
B. Product/service quality, features and use	**B.** Shelf policy
C. Product lines, packaging, branding	**C.** Inventory policy
D. Installations, instructions, warranty,	**D.** Transportation
Promotion	**Pricing**
A. Advertising	**A.** Price levels
B. Sales promotion	I. Penetration pricing
C. Publicity	II. Skimming pricing
D. Brand names	**B.** Price changes
E. Package designs	I. Size
F. Point of purchase, salespeople	II. Timing
G. Media selection	III. Duration
I. What media?	IV. What products
II. Reach, frequency and cost	V. Against what competitors

Source: Adapted from Engel, et al., Market Segmentation, 1972, pp. 8–9.

[1] In literature, however, we can come across other terminology: segment-of-one marketing, customization, interactive segmentation, mass customization, micro-marketing and personalization (Weinstein, 2004).

3 SUMMARY

In this concluding part, a brief overview across segmentation process will be provided and finally, the target of conceptual framework – the design of preferred approach towards lifestyle segmentation – will be manifested.

As indicated, each segmentation process starts with proper definition of the market in terms of its scope, products, generic market and current/anticipated customer base. Based on these results, requirements of the study (e.g. price setting, new product development, media selection, description of consumer behavior etc.) and market in question (B2B/B2C) can be formulated. Once the purpose of research has been announced, we apply on pre-segmented market relevant segmentation base to identify segments. Next step, choice of appropriate segmentation method, follows directly after identification of these segments. Collectively, the segmentation method will be chosen on the basis of market definition (1), the purpose of the study (2) and selected segmentation base (3). As a result, formation of segments, with respect to segmentation criteria, can be performed. After segments have been formed we proceed to the next level, profiling. Profiling allows managers better understanding of formed segments and thus facilitates more confidential selection of target market. Finally, the appropriate marketing mix will be developed and applied on that target market (Wedel, et al., 2003).

Last but not least, the segmentation process has been performed with regard to four segmentation concepts (bases) from which preferred approach towards lifestyle segmentation has been elaborated. Table 9 then presents and recaps all findings relative to the lifestyle segmentation which will serve as a departure point for the development of methodology.

TABLE 9: Conceptual and methodological overview

Segmentation base	General unobservable
Segmentation variables	Personality traits, values and lifestyles
Source of data	Consumer panel and omnibus/ad hoc surveys
Data collection method	Self-administered and face-to-face interviews
Sampling	Probability sampling methods
Data analysis	Factor a., cluster a., MCA, MDS, discriminant a.,…
Typology systems	
Personality traits	Edward's personal preference schedule, Cattel
Values	Maslow , RVS, Hofstede, LOV, CCC, SVI
Lifestyles	Euro-Socio-Styles, VALS, Sinus Milieus, Experience-Milieus
Applications[1]	Classification of population, identification of prevailing trends, targeting, voting preferences, competitive positioning strategy, product design and packaging, brand image style, advertising style, methods of promotion, media and channel selection
Market orientation	B2C

[1] Cathelat Bernard, Socio-Styles, 1993, p. 24 and 172.

PART IV: METHODOLOGY

The methodological part presents *research process* decomposed into sequence of steps to be conducted. Each research project starts with the purpose of study – the research objectives and ends up with the research report. Even though each research project addresses a unique problem, yet following in-between steps shall be pursued: research design, data collection methods and forms, sampling plan, data analysis and interpretation of results.

As indicated elsewhere, for the purpose of my thesis the questionnaire data, supplied by the market research firm Median s. r. o., will be evaluated. Those data have been gathered in the framework of continuous project, Market & Media & Lifestyle-TGI, launched in 1996. MML employs licensed methodology of British research company – the BMRB International. Median has been guaranteeing minimal sample size of 15.000 respondents per year since 2000.

The MML-questionnaire interrogates respondents concerning their usage patterns within product/service/brand category (information on 200 categories of products and 3000 brands), media exposure (65 TV-stations, 82 radios, 320 print-media), leisure activities, preferences, attitudes and motivations (700 lifestyle statements) and of course, demographics. Since all data come from single source a very powerful analytical tool, cross-tabulations, can be performed.[1]

4 RESEARCH OBJECTIVES

In the framework of research objectives following considerations are to be involved:

Formulation of need
To gain a better understanding of potential customers (target group: females) in order to be able to expand into a new product category in the apparel industry.
Research questions
Q1: Who are the leading players in the Czech (apparel) market?
Q2: What are the fundamental values/needs in the Czech society?
Q3: What are the profiles of Czech women?
Q4: Which profiles can and which cannot be combined in a single product?
Q5: Which message shall be communicated to the target segment?
Specification of information needed
Information should be obtained on the standard *demographic* (age, family status, education, job position, net monthly income, presence of children, number of members in the household and national socio-economic classification) and *psychographic variables* (finance, shopping, clothing, self-evaluation, current economic situation, leisure time, family & children)
Hypothesis
Ho: Czech population embodies rather puritan-conservative attitudes with slightly rising materialistic tendencies.

[1] [online]. [cited: 2010-03-05]. Accessible from: http://www.median.cz/?lang=en&page=1&sub=1.

5 RESEARCH DESIGN

Having set the research objectives, in next step one shall opt for the type of research design. The research design, often termed as: "*the blueprint for a study that guides the collection and analysis of data*" (Churchill, 2005 p. 102), was determined to be "rather" *descriptive.* The word "rather" stands for the distinction between research designs which is rarely absolute as a study can serve several purposes.

The purpose of our study is to describe segments of potential customers (women in our case) in order to create customer profiles with respect to their psychographic and demographic characteristics. As a result, we may estimate a proportion of women who behave in a certain way (Churchill, 2005). In doing so, we shall maintain a sample which is representative and thus, enables projection of research findings to the population. Furthermore, within the framework of research design another topic needs to be addressed – the type of descriptive research study.

Longitudinal studies, as employed within MML, repeatedly measure the same sample units of a population over time, and commonly rely on relatively permanent sample of individuals, so called *panel.* The main advantage of panel data lies in its opportunity for studying the evolution of attitudes and ways of behavior by comparing the responses of the same individuals to the same questions over time (1) and in data quality and accurateness since panelists, often compensated for their participation, are open to longer and more exact interviews (2) (Churchill, 2005; Cathelat, 1993).

6 DATA COLLECTION METHODS

In this part the source of data mining and the manner by which the data are collected is to be clarified. As the data were provided by the Median we will next refer to those data as *secondary.*

The use of secondary data is encouraged mainly by the cost and time efficiency, given by the fact that: data collection form has been already designed and pre-tested, sampling plan has been devised, data have been checked for accuracy, coded and tabulated, and ultimately the field interview staff have been trained. It goes without saying, that problems of fit and accuracy, often attributed to the secondary data, are not of our interest since the purpose of our study is in compliance with the primary one (Churchill, 2005 pp. 168-170).

As data collection methods *person-administered* and *self-administered* surveys[1], using a predesigned questionnaire[2], are conducted. The former is normally face-to-face where respondent fills in the questionnaire in the presence of interviewer who acts principally as a guide. In self-administered surveys the questionnaire is sent by post, completed by the respondent at their own place and returned after a set period (Cathelat, 1993 p. 134). The questionnaire uses Likert scale requiring respondents to indicate their degree of agreement (definitely no; rather no; neither yes nor no; rather yes; definitely yes;) with lifestyle statements.

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[1] Person-administered surveys interrogates lifestyle questions and self-administered demographic questions
[2] Please find enclosed questionnaire in attachment A.

7 SAMPLING PLAN

Having specified the research objectives and developed an appropriate research design and data collection instrument, the next step in the research process is to select those elements from which the information shall be gathered.

The very first step in sampling is to determine the *target population* about which we wish to make an inference. In our study, the target population is defined as a female in the age from 12 to 79 (obviously, the simpler the definition of target population the higher the incidence)[1].

In second step the *sampling frame* is to be defined, frequently denoted as: *"the listing of the elements from which the actual sample is drawn"* (Churchill, 2005 p. 324). For the purpose of MML actual listing of municipalities (administered by the Czech statistical office) was used.

In the third step the sampling procedure is to be selected. Basically, we distinguish between probability and non-probability sampling designs. As the representativeness of sample in population was critical for MML (and so does for us), first and foremost, *probability sampling*[2] and specifically *stratified sampling*[3] of municipalities was applied, followed by *simple random sampling* of households and *non-probability quota sampling*[4] of respondents.

Stratified sampling shall be performed when researcher knows the answers to research question are likely to vary by subgroups (Tapachai, 2008). Commonly, following steps are pursued (Churchill, 2005 p. 340): the population is divided into mutually exclusive (i.e. every element in the population must be assigned to only one stratum) and exhaustive (i.e. no population elements are omitted) subsets (i.e. municipalities), called strata (1), from which, taken each stratum separately, a random sample (i.e. households) is subsequently chosen (2). Recall that stratified sampling is one way of ensuring adequate representation of true population from each strata, following expression shall provide the confidence interval within which the derived true mean μ falls: $\bar{x} - zs_{\bar{x}} \leq \mu \leq \bar{x} + zs_{\bar{x}}$, where $\bar{x}$ stands for sample mean, z for confidence interval (say 95%), and $s_{\bar{x}}$ for standard error of the estimate. In doing so, the sample mean and the standard error of estimate are determined by *weighting* [5]of the individual strata results (Churchill, 2005)

Final step in sample selection process requires *sample size* to be set. According to the rule of thumb, commonly employed in the lifestyle typologies, the sample size minimum is found within the range of 10 to 20 respondents per variable (Thompson, 2004). As our sample size reaches 7615,8 (weighted according to the population size) and number of variables is 81 this rule is safely satisfied.

Finally, the data are collected, edited (to achieve some minimum quality standards) and coded (by transforming the raw data into numerals to enable subsequent tabulation).

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[1] Incidence refers to the percentage of population which matches characteristics of target population.
[2] In probability sampling each population element has a known and equal chance (probability) of being included into the sample.
[3] Stratified sampling is a method of sampling from population by which relatively homogenous groups are created.
[4] MML used quota sampling to ensure certain representativeness of sample with respect to sex, age and education.
[5] Weights relate to the stratum population size relative to the total population size.

8 DATA ANALYSIS

This part intends to provide a theoretical treatment of methods assessing variability between data, namely *factor analysis*, *cluster analysis, contingency tables and multidimensional scaling*, respectively. Collectively, they refer to so called *multivariate statistical methods* that have been developed to handle situations in which multiple (i.e. more than two) variables are involved (Marcoulides, et al., 1997). Those methods take into account natural settings in which a number of dependent variables are manipulated by a number of independent variables (as opposed to simple bivariate methods considering single dependent and single independent variable).

A statistical study typically involves group of objects, *entities*, which are measured on some common attributes, *variables*. Associations between objects and variables take the form of $n \times p$ matrix in which variables (in our case questions) are arranged in p-columns and objects (in our case individuals) in n-rows. Throughout the text the letter n is used for the total number of individuals ($i = 1, 2,\ldots, n$) and letter p for number of variables ($j = 1, 2,\ldots, p$). Original matrix is denoted with letter X and particular value of this matrix, called *observed value*, x_{ji}. Such value x_{ji} represents value of j-attribute being measured on i-individual.
Furthermore, two special instances of a matrix may occur, namely a single row, called *row vector* ($1 \times n$ or $1 \times p$) or single column, called *column vector* ($n \times 1$ or $p \times 1$). Now any array, say raw vector $x_i^T = (x_{i1}, x_{i2}, \ldots, x_{ip})$, may be understood as one point in a plane being characterized by p-coordinates (Harman, 1967).

8.1 Factor Analysis

Factor analysis[1] is a statistical method which aims to reduce the number of variables (1) and to detect the structure of relationships between variables (2)[2]. Put another way, factor analysis can be used to summarize relationships of initial observed variables (in factor terminology *manifest variables*) into the form of fewer and thus more meaningful unobserved variables (in factor terminology *factors* or *latent variables*). As a result, the purpose of factor analysis is to create new uncorrelated[3] factors which would capture the most of the "essence" (in factor terminology *variability*) of initial variables. That is, factor analysis presumes that these relationships (in factor terminology *covariances* or *correlations*) among manifest variables are to be evoked by unobserved fewer set of underlying factors.

Finally, by performing factor analysis[4] the number of latent variables and the underlying structure of a set of variables may be identified (Suhr).

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[1] The birth of factor analysis is generally ascribed to psychologists Spearman and Pearson at the beginning of 20th century, however, the term "factor analysis" was first introduced by Thurstone in 1931 (Harman, 1967).
[2] [online]. [cited: 2010-03-10]. Accessible from: http://www.statsoft.com/textbook/principal-components-factor-analysis/?button=1.
[3] Criterium of no multicollinearity between predictors (in our case factors).
[4] Or to be precious "Exploratory Factor Analysis" (EFA).

8.1.1 Basic Model of Factor Analysis

In order to be more familiar with discussed relationships between manifest and latent variables let me consider an analogy using means of regression model equation. For simplicity, suppose simple linear regression in which the observed variable is explained by the regressor (multiplied by its coefficient) and the residual error term (Adamec, 2004).[1]

Similarly, in factor analysis, the observed variable may be described linearly in terms of *common factors* (multiplied by its coefficients, referred to as *factor loadings*) and a *unique factor*. The basic factor analysis model[2] may be put in the following form[3]:

$$z_j = a_{j1}F_1 + a_{j2}F_2 + \cdots + a_{jm}F_m + d_jU_j \qquad (j = 1, 2, \ldots, p), \tag{8.1}$$

where each of p manifest variable is described linearly in terms of m (much smaller than p) new common factors F_1, $F_2 \ldots F_m$, its a_{jm} coefficients (i.e. correlations between m-th factor and p-th variable) and by d_jU_j expression of unique factor.

Now, by applying the logic of the decomposition of sums of squares in regression to factor analysis, the common factors would account for explained portion of variance of the manifest variable while the unique factor would account for the remaining unexplained portion (including error).

Furthermore, as the variables (manifest and latent) in factor analysis are commonly standardized (i.e. mean is equal to zero, standard deviation to unity)[4] and as the unique factors are always uncorrelated with the common factors (and the common factors are uncorrelated among themselves), we can directly proceed to following expression of the *total unit variance:*

$$S_j^2 = 1 = a_{j1}^2 + a_{j2}^2 + \cdots + a_{jm}^2 + d_j^2 \qquad (j = 1, 2, \ldots, p). \tag{8.2}$$

Consequently, from the decomposition of the total unit variance the explained variance, so called *communality,* of the variable that is due to common factors may be inferred. Communality may be computed from the sum of the squares of the common factor loadings:

$$h_j^2 = a_{j1}^2 + a_{j2}^2 + \cdots + a_{jm}^2 \qquad (j = 1, 2, \ldots, p). \tag{8.3}$$

Now, in "matrix terminology" the total variance, represented by the trace of correlation matrix (with ones on diagonals), may be expressed as the trace of the decomposed adjusted correlation matrix (with communalities on diagonals) and the trace of residual correlation matrix (with 1 − communalities on diagonals). Then, the model applies this matrix notation:

$$Z = FA^T + E \tag{8.4}$$

where Z is $n \times p$ matrix of manifest variable, F is $n \times m$ matrix of common factors, A is $p \times m$ matrix of factor loadings and E is $n \times p$ matrix of unique factors.

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[1] Following assumption of zero absolute regression coefficient.
[2] The principal axis factoring (PAF) model is, for instance, derived from (8.1).
[3] All involved formulas follow: Harman, H. *Modern Factor Analysis,* 1967, pp.15–26.
[4] Standardizing is a conversion process which allows data on different scales or coming from different distributions to be compared by bringing them to a common scale.

8.1.2 Factor Extraction Method

After introduction of factor analysis rationale and its basic factor model (by means of the regression model) we may proceed to the numerical aspects of factor analysis being concerned with estimates of factor *loadings* and the *eigenvalues*. Such numerical process of estimation is commonly known as *factor extraction* (Afifi, et al., 1996). In my thesis, as the method of factor extraction *principal component analysis* (PCA) will be employed.

Principal Component Analysis

The PCA[1] technique performs on the same principle as specified in the 8.1.1 chapter in that it summarizes relationships between manifest variables into new uncorrelated variables, called *principal components*. And similarly, as each manifest variable may be expressed as the linear combination of these principal components multiplied by its coefficients (i.e. correlations or covariances between manifest variable and the component) where *error term is equal to zero*, then the expression of (4.1) simplifies to:

$$z_j = a_{j1}F_1 + a_{j2}F_2 + \cdots + a_{jp}F_p \qquad (j, F = 1, 2, \ldots, p). \tag{8.5}$$

Again, since it is customary to express manifest variable in a standard form (i.e. to select level of measurement so that sample standard deviation is one) and since all components are uncorrelated (i.e. orthogonal), we may directly proceed to the following formula:

$$S_j^2 = 1 = a_{j1}^2 + a_{j2}^2 + \cdots + a_{jp}^2 \qquad (j = 1, 2, \ldots, p). \tag{8.6}$$

Logically, as manifested in both notations, an important feature of new components may be derived in that they account for a *maximum variance* of the variable. More specifically, the first principal component F_1 is the linear combination of the original variable which contributes a maximum to its total variance. Now, the second principal component F_2, uncorrelated with the first one, contributes a maximum to the residual variance; and so on until the total variance is analyzed.(Harman, 1967).

Eigenvalues of Principal Components

Eigenvalue describes the amount of variance each successive component can reproduce. Obviously, based on the assumption of maximum variance, eigenvalue of first component tends to be the greatest one. The resulting quantity for the first component (calculated as a sum of squares of component coefficients) is described as follows:

$$Eigenvalue\ of\ first\ component = \sum \mathrm{a}_{\mathrm{j1}}^2 \qquad (j = 1, 2, \ldots, p). \tag{8.7}$$

As it turns out, the sum of the variance, that is, the sum of all p eigenvalues is equal to the sum of variance of all initial manifest variables.

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[1] The PCA technique is based upon the early work of Pearson (1901), however, fully developed by the work of Hotelling (1933) (Harman, 1967).

8.1.3 Number of Factors Retained

Having extracted the components (or factors) we shall be concerned with the fact how many of them are to be retained. For that purpose two guidelines will be applied:[1] the *Kaiser criterion* (1) and the *Cattell's scree test* (2). According to Kaiser only that components whose eigenvalues exceed one shall be retained. In essence, by doing this, we extract as much as the equivalent of the initial variable (Jackson, 1991). In scree test (a graphical method) we plot number of components (on horizontal axis) against its eigenvalues (on vertical axis) and retain only those components whose values appear to be above the "elbow" (termed as cliff) while values being below (termed as rubble) shall be deleted (Jackson, 1991).

8.1.4 Factor Rotation

Recall that the main purpose of factor analysis is to derive from data easily interpretable common factors seems not always to be true. Therefore, another method which would produce new factors whose loadings are easy to interpret (i.e. are very low or very high)[2] has to be pursued (Afifi, et al., 1996). Such method is *rotation* whose aim is to rotate with the factor axis, measuring the locations of manifest variables in the factor space, in a manner to produce more obvious factor constructs, so called *simple structure*.

For the purpose of my thesis the *varimax* rotation technique (which rotates new axis so as to be orthogonal to each other) will be applied. However, it is necessary to note that orthogonal rotation does not alter communalities nor the cumulative percentage of variance explained by the common factors. Nevertheless, what varimax does is redistribution of location of variance within the solution. Put another way, the variance explained by rotated factor varies from variance explained by unrotated factor (Thompson, 2004).

8.1.5 Factor Scores

Once the extraction of factors (PCA) and the factor rotation (varimax) are accomplished, we may be interested in obtaining a set of composite *scores*[3] an individual has for each factor. In real research is, however, the estimation of factor scores reasonable only if it is used in further analysis (here scores will be used in cluster analysis and MDS).

In my thesis, the *Bartlett method* of weighted least squares estimation will be followed. This method intends to decrease the influence of the unique factors by minimizing the sum of squares of the unique factors over the range of variables (Thompson, 2004).

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[1] However, in many cases the decision about the number of retained components (or factors) is rather affected by the ease of their interpretation.
[2] According to Thompson (2004, p. 41), for instance, loadings above 0,35 are referred to as high.
[3] Scores are assigned just to rotated solution of factors.

8.2 Cluster Analysis

This section extends the discussion of data reduction methods from chapter 8.1. Chapter 8.1 aimed at reduction of variables (or columns from data matrix X) while cluster analysis is focused on the *reduction of objects* (or rows from data matrix X). The overall objective of cluster analysis is to partition those objects (i.e. observations) in such a way that characteristics of objects within a cluster are very similar, whereas characteristics of objects among clusters are very distinct (Jobson, 1992).

Cluster analysis takes as its departure point *n* × *n proximity matrix* (denoted as P with elements $p_{rs}, r, s = 1, 2, \dots, n$) that measures the similarity of the observations across the variables (as compared to PCA which starts with correlation or covariance matrix measuring the variation in similarity among pairs of variables across observations). Quasi to PCA cluster analysis seeks off-diagonal elements that are relatively large (or low) and thus indicating similarity (or dissimilarity) of objects (Jobson, 1992).

After (dis)similarity of objects is assigned, next step is to compute similarities between two groups of objects. Ultimately, objects ought to be clustered by means of partitioning techniques.

8.2.1 Measurement of Proximity Between Objects

Proximity measures usually consider two types: the degree of *similarity* (commonly referred to as *correlation-type* measures) or the degree of *dissimilarity* (commonly referred to as *distance-type* measures). As two objects become more similar the value of similarity is increasing while the value of dissimilarity is decreasing and vice versa. As indicated, the proximity matrix takes *n* × *n* form with zeroes on the diagonal as for distance matrix and with ones on diagonal for correlation matrix (Jobson, 1992). Further text, however, is merely devoted to the distance type measures (see table 11).

Given two objects *r* and *s* (*r, s* = 1, 2,…, *n*), the proximity measure p_{rs} is a measure of similarity/dissimilarity if p_{rs} satisfies the following:[1]

TABLE 10: Criteria of dis/similarity in cluster analysis

Criteria of similarity	Criteria of dissimilarity
• $0 \leq \lvert p_{rs} \rvert \leq 1$ for all objects *r* and *s;*	• $p_{rs} \geq 0$ for all objects *r* and *s;*
• $p_{rs} = 1$ iff *r* and *s* are identical;	• $p_{rs} = 0$ iff *r* and *s* are identical;
• $p_{rs} = p_{sr}$.	• $p_{rs} = p_{sr}$.

[1] All involved criteria and formulas follow: Jobson, J. *Applied Multivariate Data Analysis*, 1992, pp. 486–508.

TABLE 11: Formulas of distance-type measures (Euclidean distances)

Euclidean distance	
$d_{rs}^2 = \sum_{j=1}^{p}(x_{rj} - x_{sj})^2.$	(8.8)
Euclidean distance and the centroid	
$d_{rs}^2 = 2\left[\sum_{j=1}^{p}(x_{rj} - \bar{x}_{.j})^2 + \sum_{j=1}^{p}(x_{sj} - \bar{x}_{.j})^2\right].$	(8.9)

As the main disadvantage of (8.8 and 8.9) lies in its sensitivity to the scales of measurement, that are generally not same for all *p* variables, it is preferable to transform those variables to the common scale. Table 12 outlines possible transformations.

TABLE 12: Transformation of variables

Standardization	
$z_{ij} = \frac{x_{ij} - x_{.j}}{s_j}.$	(8.10)
Weighted Euclidean distance	
$d_{rs}^2 = \sum_{j=1}^{p}\left(\frac{1}{s_j^2}\right)\left(x_{rj} - x_{sj}\right)^2 = (x_r - x_s)^T D^{-1}(x_r - x_s).$	(8.11)
where D is the diagonal matrix with diagonal elements given by its variance, where $j = 1, 2, \ldots, p$; and $(p \times 1)$ vectors x_r and x_s denoting observations.	

8.2.2 Measurement of Proximity Between Groups

After proximity measures of objects are determined we shall proceed to the core part – cluster analysis. Cluster analysis techniques can be classified into five categories: *hierarchical, partitioning* (i.e. techniques prohibiting overlapping)*, Q-sort, density and fuzzy clustering* (i.e. techniques allowing overlapping). While the clustering techniques may vary across different applications and softwares, all techniques share the same target, that is, to find natural clusters (Jobson, 1992). For the purpose of my thesis, however, only partitioning techniques will be outlined next.

K-Means algorithm, the partitioning technique employed in my thesis, measures the proximity between groups using the *Euclidean distance* between group centroids. Partitioning begins with given target numbers of clusters, say *g,* and then reassigns those objects until they are located to the group with the nearest centroid. Whenever objects change the membership (i.e. are reassigned to another group) group centroids must be revised. Equilibrium is reached when all g-clusters are located in the group whose centroid is the closest (Jobson, 1992).

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8.2.3 Optimality Criterion

After program executed cluster analysis (by means of partitioning technique), in next step we shall arrive at decision how many clusters will be retained. Generally, there are two main approaches: *heuristic* procedures and *formal* tests. Whereas, the latter in majority cases applies decomposition of total variance (adjusted into several forms) under following assumptions.

Given the *g* groups ($k = 1, 2,\ldots, g$) of *i* objects with group sizes ($i = 1, 2,\ldots, n_k$); where each object is measured on a *p*-dimensional variable; following matrix notation (in $p \times p$ form) can be used to assign differences between the *g* groups: T = W + G; where T stands for the total sum of squares, W for the within sum of squares and G for the among sum of squares.[1] In doing so, we strive to minimize the within group variability and to maximize the among group variability (*Ward's criterion*). Other softwares offer less common *Pseudo-F, Pseudo-t^2* and *Beale's F ratio* statistics or very comfortable graphical representation such as *dendograms*.[2]

8.3 Contingency tables

Once, clusters have been formed in next step contingency tables will analyze dependencies between rows – demographics (age, education, family status, presence of children, job position, net monthly income, number of household members and national socio-economic classification) and columns – formed clusters.

Adjusted standardized residuals (between frequencies to be expected if variables are independent) take on values z (-3,29; -2,58; -1,96; 1,96; 2,58; 3,29) corresponding to the level of significance where 5% stands for (---), 1% for (--), 0,1% for (-), and so forth. Table 13 outlines mentioned illustrations.

TABLE 13: Residuals and confidence intervals

$u_i \leq -3{,}29$	$---$
$-3{,}29 < u_i \leq -2{,}58$	$--$
$-2{,}58 < u_i \leq -1{,}96$	$-$
$-1{,}96 < u_i < +1{,}96$	0
$+1{,}96 \leq u_i < +2{,}58$	$+$
$+2{,}58 \leq u_i < +3{,}29$	$++$
$u_i \geq +3{,}29$	$+++$

[1] As presentation of T, W, G formulas is beyond the purpose of my thesis it suffice to note that the three sums of squares over all *p* variables are equal to the sums of the diagonal elements of T, W, and G matrices (Jobson, 1992).

[2] Other criteria used for assessing the number of clusters are AIC and BIC.

8.4 Multidimensional Scaling

Having allocated the basic demographic information to retained clusters one might be next interested in their spatial representation in *p*-dimensional "map". This is what is meant by multidimensional scaling (commonly abbreviated as MDS).

MDS is another multivariate technique that uses proximities between clusters to produce geometrical configuration of points on the map, each point corresponding to one of the clusters. The greater the dissimilarity among clusters the further the objects will be on the map and vice versa. As we attempt merely to preserve the rank order among the dissimilarities we will further consider only *nonmetric* solution (Jobson, 1992).

Nonmetric MDS begins with an ($n \times n$) proximity matrix D of dissimilarities δ_{rs} (with zeroes on diagonal) where proximity measures are based on perceptions of (dis)similarities derived from human judgments. The objective is to define a set of *p* underlying dimensions ($X_1, X_2,\ldots, X_p$) such that: *"the coordinates of the n objects along the p derived dimensions yield a Euclidean distance matrix – related to the original dissimilarities."* (Jobson, 1992 p. 570).

Once the dimensions have been determined (for our purpose of study 2-dimensional representation is adequate)[1] we will progress to second step, interpretation of axes. Here, retained components from factor analysis are used to produce plots showing the dissimilarities of *n* objects in *p*-dimensions. Put another way, factors account for dissimilarities between clusters that can be captured in p-dimensional plane, where *p*-number of dimensions is much lower than number of retained factors. That is, the initial number of variables (corresponding to the number of questions) is first reduced to a lower number of more meaningful factors (by means of factor analysis) that are subsequently subjected to the nonmetric MDS solution yielding only 2-dimensions. Owing to this, MDS might be understood as simplification of factor analysis (Jobson, 1992).

Measures of Goodness of Fit (Stress)

However, MDS is not so much an exact procedure as rather a way how distances (dissimilarities) among objects can be projected in 2-dimensional plane, so that the loss of information is minimal. It actually rearranges the objects in the space and checks at the same time how well the distances (dissimilarities) between objects can be reproduced. In MDS terminology, it uses a function minimization algorithm that evaluates different configurations with the goal of maximizing the goodness-of-fit (*Phi*).

$$Phi = \sum[d_{rs} - f(\delta_{rs})]^2. \tag{8.12}$$

It holds the smaller the *Phi* the more exact is the fit of the reproduced distance matrix d_{rs} to the observed distance matrix δ_{rs}.

[1] Three-dimensional representation can also be produced graphically, however, its interpretation is somewhat more complex.

9 SUMMARY

Summary once again recaps all preceding chapters from methodological part and pinpoints all steps necessary to accomplish research process in the final report (table 14).

TABLE 14: Research proposal

Research Objectives • **Formulation of need:** To gain a better understanding of potential customers in order to be able to expand into a new product category in the apparel industry. • **Research questions:** • **Q1:** Who are the leading players in the Czech (apparel) market? • **Q2:** What are the fundamental values/needs in the Czech society? • **Q3:** What are the profiles of Czech women? • **Q4:** Which profiles can and which cannot be combined in a single product? • **Q5:** Which message shall be communicated to the target segment? • **Hypothesis:** Czech population embodies rather puritan-conservative attitudes with slightly rising materialistic tendencies. • **Specification of information needed:** Information should be obtained on the standard demographic (age, family status, education, job position, net monthly income, presence of children, number of members in the household and NS-SEC) and psychographic variables (finance, shopping, clothing, self-evaluation, current economic situation, leisure time, family & children)
Research Design • Descriptive research design; longitudinal descriptive studies relying on panel data • Secondary syndicated data supplied by the Czech market research firm Median s. r. o.
Data Collection Methods • Person-administered (demographics) and self-administered surveys (psychographics) • Collection instrument: questionnaire compromising 8 demographic and 81 psychographic statements using Likert scaling (definitely no; rather no; neither yes nor no; rather yes; definitely yes; N/A); data evaluation instrument: Data Analyzer
Sampling plan • Target group: Czech females in the age of 12 + • Fieldwork: 07.01.2008–07.12. 2008 • Sampling procedure: stratified sampling of municipalities, random sampling of households, quota sampling of final respondents • Sample size: 7615 respondents (weighted according to population size) • Response rate[1]: 79,3 % of respondents who answered all questions
Data analysis • Factor analysis: factor extraction by means of PCA and factor rotation by means of varimax • Cluster analysis: partitioning technique applying k-means (adjust initial cluster centers) • Contingency tables • Non-metric multidimensional scaling (based on Euclidean distances between objects)

[1] For reference on calculations of response rate see attachment B.

PART V: RESULTS AND INTERPRETATIONS

This section is concerned with the practical part of the thesis divided into chapters – factor analysis, cluster analysis (together with contingency tables) and MDS, respectively. The target of this section is to provide results along with their interpretations.

Here I briefly review some few facts about analysis to be applied. Factor analysis in first step extracts components (by means of PCA) which will be subsequently subjected to the rotation (by means of varimax). As a result simple structure will be achieved facilitating interpretation of retained factors. The target of factor rotation is to reveal underlying characteristics of respondents, their attitudes and prevailing stereotypes in the society. In next step, cluster analysis, retained factors will describe "behavior" of each cluster (clusters will be generated by k-means technique); and through contingency tables basic demographic information will be assigned to formed clusters in order to build complete portrayal of formed segments. Finally, MDS will summarize all results in two-dimensional map.

10 FACTOR ANALYSIS

Recall that factor analysis aims at factor extraction so that maximum possible variance of measured variables (referred to as communality) can be reproduced and at the same time meaningful interpretation of retained factors can still be performed. Put another way, if we retained more factors, so that greater portion of initial variance can be explained, we would encounter interpretation problems and vice versa. Bearing this in mind, I have decided to retain only nine factors whose eigenvalues are greater than 1,5 (accounting for 41,10 % of initial total variance) since interpretation of eighteen factors (being in compliance with Kaiser criterion) doesn't provide any meaningful solution.[1]

Table 15 illustrates those findings. First column presents number of retained components and second column their eigenvalues. Eigenvalue describes the amount of variance each successive component can reproduce (third column).[2] Based on the assumption of maximum variance, eigenvalue of first component (10,879) is the greatest one and thus accounts for the greatest portion of initial variance (13,43 %); second component with eigenvalue 7,092 contributes a maximum to the residual variance (8,76 %); and so on until the total variance is analyzed. This implies that the sum of all eigenvalues is equal to the initial overall variance. As data were standardized (mean is zero, standard deviation approaches to unity) prior to factor analysis we can conclude that this variance corresponds to the number of variables, that is 81.[3] Fourth column cumulates those portions of explained variance. For instance eight components explain 39,23 % of initial variance, nine components 41,01 % of initial variance…

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[1] Please find all extracted components and their basic characteristics in attachment C.

[2] Explained variance (third column) is calculated as the ratio of corresponding eigenvalue and the sum of all eigenvalues (for instance first component can reproduce 10,879 / 81 × 100 = 13,43 % of initial variance).

[3] Please find further reference on all eigenvalues in attachment C.

Fifth, sixth and seventh column displays rotated solution of factors. As we can see variance explained by nine factors (seventh column) did not alter compared to unrotated solution (fourth column). However, this doesn't hold for single factors whose rotated values (in fifth and sixth column) significantly differ from unrotated solution (in second and third column).

TABLE 15: Explained variance by PCA and Varimax

MML-TGI 1.Q–4.Q 2008	**Unrotated factors PCA**			**Rotated factors Varimax**		
Factor number	Eigenvalue	% of variance	Cumulative %	SS f. loadings	% of variance	Cumulative %
1	10,879	13,43	13,43	5,956	7,35	7,35
2	7,092	8,76	22,19	5,312	6,56	13,91
3	3,882	4,79	26,98	4,742	5,85	19,77
4	2,579	3,18	30,16	3,917	4,84	24,60
5	2,195	2,71	32,87	3,013	3,72	28,32
6	2,009	2,48	35,35	2,992	3,69	32,01
7	1,613	1,99	37,34	2,857	3,53	35,54
8	1,532	1,89	39,23	2,642	3,26	38,80
9	1,513	1,87	41,10	1,863	2,30	41,10

Having opted for nine factors based on assumption of explained variance and the ease of interpretation we shall, in addition, check for how much of variance in measured variable (that is due to common factors) can be reproduced. This is what is meant by communality. If communality coefficient of measured variable approaches to zero, it means that this variable is weakly reproduced by retained factors. In our case, for instance, question 361 *"Today´s society is oriented too much to consumption"* shows low value.[1] Low values of communalities[2] can be improved by retaining more factors which, in turn, impede their interpretation.

Table 16 presents factor loadings allowing for those interpretations. Factor loadings are correlations between factors and manifest variables whose values fall within range -1 for definitely no and +1 for definitely yes. For instance, loading of factor *Self-involved/Trendy* for question 330 expresses strong consent to that question. As it turns out, correlations greater than 0,3 are marked to stress those questions contributing to the final interpretation of respective factors.

To conclude, the result of PCA is a reduction of large battery of initial variables (81 questions) to smaller number of more meaningful factors (nine retained factors). The effect of rotation, by contrast, may be primarily viewed in easier interpretation of factor loadings.

[1] Please find further reference on all communalities in attachment D.
[2] Communality is computed from the sum of the squares of the common factor loadings.

TABLE 16: Rotated factor matrix

Questions/Factor loadings	Self-involved Trendy	Demanding Need to show-off	Security Old-fashioned	Practical Rational	Experience Self-development	Conservative Traditional values	Family-oriented Consistent	Spontaneous Media control	Able to manage money Money prudent
330 One of my life principles is to be well-dressed.	0,75	0,14				0,11			
333 It is very important for me how I am dressed, how I look.	0,73	0,15	0,20						
324 When it comes to clothing I have a very good taste.	0,69	0,14							
310 I dress in such way to be liked by the others.	0,67	0,18	0,16			0,11			
036 I like buying clothing.	0,59	0,18	0,14	-0,22	0,11			0,18	
311 Women should always look good.	0,59	0,12	0,38	0,16			0,13		
323 My job requires to be well-dressed.	0,51	0,17	-0,29	-0,10	0,14	-0,11			0,11
312 I have plenty of clothes.	0,51		-0,19					0,24	0,26
355 I am self-confident enough.	0,40	0,11			0,24				
341 In my life I would like to achieve as most knowledge and wisdom as I can.	0,38	0,22			0,34	-0,17	0,20		0,14
301 It takes me quite a long time to choose clothing items which really suit me.	0,37	0,26			0,13		0,15	0,12	
011 Good brand is a guarantee of a high quality.	0,16	0,65				0,11			
028 Higher price guarantees higher quality.	0,11	0,62	-0,11			0,18			
001 I prefer brand products.	0,29	0,56	-0,24	-0,22	0,15		-0,11		
025 I choose goods recommended by specialists.		0,56	-0,23				0,21	0,15	
022 I buy top-quality products only.	0,22	0,55	-0,25			-0,11	0,16	0,14	0,12
015 It's worth paying more for quality products.	0,25	0,53				-0,19	0,25	0,18	0,11
038 Quality products are always more expensive.	0,14	0,51	0,29	0,21					
004 I prefer buying foreign products.	0,17	0,50		-0,13	0,16		-0,30	0,11	0,12
006 I prefer innovative-looking products.	0,41	0,49	0,14		0,21			0,17	
029 I like trying new brands.	0,28	0,46		-0,14	0,17			0,36	
300 I prefer buying more expensive but better quality clothing.	0,44	0,46	-0,24	-0,16	0,12	-0,16	0,12		0,11
002 I am often influenced by advertising when doing my choice of products.		0,44	-0,15			0,13	-0,15	0,33	
005 The attractive looks and nice wrapping are the most important features of products.	0,18	0,43			0,17	0,19	-0,21	0,19	
024 I usually like quite expensive goods.	0,30	0,43	0,28					0,15	
039 I like to buy nice things.	0,39	0,40	0,31		0,11			0,22	
012 The quality of Czech products is not always good.		0,35	-0,19		0,15				-0,14
705 I borrow money and do not care much about the ends.			-0,55		0,20	0,20	-0,15	0,15	
318 When it comes to fashion I am usually a step ahead of other people.	0,38	0,22	-0,52		0,14		-0,11	0,18	
309 I prefer tailor-made clothing.		0,11	-0,52						0,15
620 I consider marriage as an anachronism.		0,15	-0,49		0,31	0,11	-0,25	0,10	
041 At present the market is well supplied with products.	0,21	0,15	0,46	0,22			0,14	0,20	
213 The government should guarantee reasonable living standards for everyone.	0,12		0,45	0,25		0,12			
385 You can learn about a man when seeing a car he drives.			-0,44		0,10	0,34	-0,18	0,22	
545 I often watch TV or listen to the radio in my free time.			0,40	0,26		0,13			
698 I have got lots of things others can envy me.	0,11	0,12	-0,38	-0,12				0,19	0,31
224 The decline of our society can be put to a halt only by enforcing more strict laws.	0,20		0,35	0,21		0,22	0,12		0,13
222 Private enterprise ensures further growth of our society.	0,15	0,22	0,26		0,20		0,14		0,16
008 I don´t care about brand when shopping - I just take into account the type of product.		-0,23		0,59				0,21	
326 I like to dress inconspicuously.			0,14	0,53		0,17		-0,19	

Questions/Factor loadings	Self-involved Trendy	Demanding Need to show-off	Security Old-fashioned	Practical Rational	Experience Self-development	Conservative Traditional values	Family-oriented Consistent	Spontaneous Media control	Able to manage money Money prudent
010 The most important thing about goods is its real utility value.			0,27	0,53			0,16		
316 I need just a few pieces of clothing.	-0,43			0,51		0,15		-0,15	
007 I buy Czech products as much as I can.			-0,10	0,51	-0,14		0,36	0,14	
037 I got used to certain range of products which I only buy.		0,12		0,50		0,15			
019 I use discounts as much as I can.		-0,18	0,26	0,49		0,15	0,11	0,29	-0,13
314 I like to dress casually.			0,27	0,44	0,20			-0,11	
334 Clothes should be primarily practical and comfortable.	0,13		0,39	0,42	0,12		0,15	-0,14	
336 Buying new clothes before the old one is completely used up is unnecessary.	-0,40	-0,13	-0,26	0,41		0,19			
021 If I find a brand which suits me I do not look for a change.		0,28		0,36			0,13		
018 When doing a major shopping I prepare a shopping list in advance.				0,36	-0,15		0,32	0,19	
370 I would like to make only as much money as I need for my life.			-0,29	0,30	0,14		0,22	-0,16	-0,18
525 In my free time it is important for me to have fun.	0,15	0,13			0,70		0,13	0,11	
526 In my free time it is important for me to meet new people - find new places.	0,20	0,15		-0,12	0,64		0,15	0,17	
527 It is important for me to spend my free time on doing my hobbies.	0,16		0,19		0,49				
337 I live to enjoy my life.	0,12	0,22	-0,18		0,49		-0,22		
381 I like changes. I need to switch from the routine life.	0,26	0,18	-0,28		0,46			0,10	-0,10
349 I ‘d like to achieve in my life a high-rank position.	0,34	0,21	-0,33		0,37				0,13
368 I often procrastinate - I do my tasks at the latest.			-0,20		0,36		-0,15	0,23	-0,26
632 The most important family matters should be decided primarily by the husband/father.			-0,22			0,69			
630 Household work should be done preferably by women.			-0,24			0,68	0,14		
627 It is men´s task to ensure financial means for the family.					0,11	0,59			
621 When it comes to priorities a woman always should put her family before her career.				0,16	-0,13	0,54	0,23		
688 One of the most fundamental preconditions of a happy life is to have enough money.	0,20		0,35		0,16	0,39	-0,16	0,10	0,10
397 I cling to traditional values.				0,29	-0,16	0,32	0,30	-0,11	
636 Partner relationships are too permissive nowadays.			0,27	0,29		0,32	0,14		
686 I feel always a bit sorry when I have to spend money.			0,13	0,19	0,13	0,31			0,22
523 It is important for me to spend my free time with my children.					0,12		0,60		
344 My major life objective is to take care about my family.	0,13		0,25	0,12			0,60		
524 In my free time it is important for me to do something useful.					0,27	0,11	0,54		
360 I like order and organization in all my belongings.	0,26		0,28	0,27		0,12	0,34	-0,12	0,17
376 Everyone should be responsible of his well-being.	0,13	0,21		0,10	0,13	0,13	0,34		0,15
374 The principles of Christianity hold perpetually.		0,11		0,18		0,27	0,31	-0,11	
361 Today´s society is oriented too much to consumption.			0,13	0,23		0,13	0,28		0,10
016 I often buy something that I don´t really need.		0,30	-0,11	-0,11	0,17			0,61	
013 When shopping I often buy something I have never bought before.		0,32			0,11			0,59	
739 I often buy goods directly propagated in shop.		0,19	-0,12	0,16				0,56	
020 I often buy something just to make myself happy.	0,26	0,27			0,12		0,13	0,53	
681 I can always make ends meet.							0,12		0,68
685 I save money regularly.							0,16		0,67
702 I would like to save money but it is very hard.			0,32	0,22	0,14	0,21			-0,34
684 Money can buy almost everything today.	0,10		0,29		0,15	0,27	-0,19	0,11	0,29

Interpretation of Factors

As argued elsewhere, factors with loadings above 0,3 (in both directions) are marked to pinpoint those bundle of questions contributing to the interpretation of respective factors. The goal of interpretation is to detect attitudes, motivations, needs and stereotypes attributed to each factor.

1. Factor – Self-involved/Trendy

First factor relates to those variables indicating very positive attitudes to shopping and high level of self-confidence defined by strong concern for outward appearance, carrier and achievements.

2. Factor – Demanding/Need to show-off

Second factor expresses positive attitudes to top-quality, innovative, attractive-looking and foreign products. Brand or high-priced products are directly associated with good quality and as such give woman confidence in purchase choices since she is often influenced by advertising, nice wrappings or goods recommended by specialists.

3. Factor – Search for security/Old-fashioned

Third factor expresses puritan attitudes to society, search for security and stability and disinterest in fashion matters (negative factor loadings).

4. Factor – Practical/Rational

This category embodies utility-oriented consumption, casual and practical attitudes to clothing, loyalty to products and concern for domestic goods.

5. Factor – Search for experience/Self-development

This factor reflects modern attitudes, free time oriented consumption, need to live passionate life and motivation to work on self-development.

6. Factor – Conservative/Traditional values

Sixth factor concerns variables symbolizing traditional views on male and female roles in the society, given by high values of factor loadings.

7. Factor – Family-oriented/Consistent

Seventh factor describes strong orientation to family, "law & order" seeking needs.

8. Factor – Spontaneous/Media control

Emotional fulfillment, spontaneity and sensitivity towards external factors (as media) are true for this category.

9. Factor – Able to manage money/Money prudent

Ninth factor corresponds to attitudes to money. High values of factor loadings indicate economical thinking and ability to manage money; low values, by contrast, difficulties to make ends meet.

In the following chapter the interpretation of clusters, so called *profiling*, will be performed on a set of retained factors. Put another way, each cluster will summarize factor attributes into a single profile.

11 CLUSTER ANALYSIS

After specification and subsequent interpretation of nine factors (out of 81 variables), cluster analysis is to be executed. To reiterate the target of cluster analysis is partition of respondents into groups in such a manner that portrayals of respondents within one group are very similar, whereas those between groups are very distinct. For this purpose, k-means partitioning algorithm will be applied. This technique rests on measuring of proximity between group centroids using Euclidean distance. Here I briefly outline the rationale behind this technique.

Partitioning begins with some preselected or target number of k-clusters. A random allocation of objects into k-clusters is carried out followed by calculation of group centroids. Next, the proximities between each object and each cluster are determined and objects are then placed to that cluster whose centroid is the nearest. Proximities are recalculated each time object changes cluster. Process of reallocation of objects to groups is performed until all objects belong to cluster to which they are closest. Ultimately, final centroids of clusters (table 18) and Euclidean distance between clusters (table 17) are computed.

Let me now be more specific about procedure I pursued. In order to enhance optimality criterion (the Ward's criterion) and in order to arrive at meaningful interpretation of clusters I carried out five iterations using k-means technique. As a result, I produced four, five, six, seven and eight cluster solutions, respectively. Having analyzed and interpreted all five outputs I opted for eight cluster solution since it provided me with the most logical construction of group portraits, the main objective of cluster analysis. Following paragraphs address those findings.

Table 17 illustrates similarity matrix (with zeroes on the diagonal) using as a degree of proximity squared Euclidean distances between group centroids. As it is obvious from the table the cluster four and two tends to be similar (low value indicating similarity), whereas clusters five and three tend to be rather different (high value indicating dissimilarity).

TABLE 17: Proximity matrix based on Euclidean distances

MML-TGI 1.Q–4.Q 2008	**Cluster distances**							
	1	2	3	4	5	6	7	8
1	—	2,569	2,800	2,689	2,845	2,355	2,698	2,664
2	2,569	—	2,692	2,079	2,352	2,407	2,374	2,232
3	2,800	2,692	—	2,536	3,101	2,625	2,573	2,568
4	2,689	2,079	2,536	—	2,556	2,423	2,360	2,333
5	2,845	2,352	3,101	2,556	—	2,665	2,498	2,552
6	2,355	2,407	2,625	2,423	2,665	—	2,470	2,524
7	2,698	2,374	2,573	2,360	2,498	2,470	—	2,566
8	2,664	2,232	2,568	2,333	2,552	2,524	2,566	—

Table 18 analyzes how each factor is distributed within eight retained clusters. Since data were standardized prior to cluster analysis we can consider three possible outcomes: values approaching plus one (indicating conformity with the factor), zero (i.e. mean, indicating neutrality of the factor), or minus one (indicating disconformity with the factor).

TABLE 18: Final cluster centers. E.g., cluster 1 is in disconformity with factor "Search for security/Old-fashioned", in conformity with factor "Practical/Rational"; and neutral to factor Family-oriented/Consistent.

MML-TGI 1.Q –4.Q 2008	Final cluster centers							
Factors/Clusters	1	2	3	4	5	6	7	8
Self-involved/Trendy	0,447	0,121	0,258	0,274	-1,124	-0,619	-0,215	0,857
Demanding/Need to show-off	0,657	0,307	0,917	-0,504	-0,403	-0,072	-0,681	-0,145
Search for security/Old-fashioned	-0,871	0,188	0,714	0,436	0,860	-1,192	0,235	0,431
Practical/Rational	0,985	0,369	-0,928	-0,296	0,798	-0,620	0,399	-0,411
Search for experience/Self-development	0,576	-0,297	0,660	0,782	-0,381	-0,105	0,067	-1,005
Conservative/Traditional values	0,654	-0,532	0,429	-0,843	0,360	0,027	-0,020	0,475
Family-oriented/Consistent	-0,080	0,548	-0,693	0,234	-0,307	-0,356	0,111	0,195
Spontaneous/Media control	0,529	-0,990	-0,090	0,311	0,056	0,031	0,198	0,392
Able to manage money/Money-prudent	0,180	0,156	-0,686	0,446	0,621	0,049	-1,440	0,297

Figure 2 sketches cluster shares under "at-least-one" (ALO) assumption. "ALO" considers those respondents whose rows contain at least one value (i.e. responded to at least one question). By contrast, "ALL" summarizes respondents who answered all questions (i.e. from 7615,8 of contracted respondents 6042,6 answered all questions). It goes without saying, that cluster six appears to be the greatest and cluster three the smallest one.

Recall that clusters are defined through nine factors (figure 3) representing respondents' characteristics, attitudes and values, collectively referred to as psychographics. In order to receive more lifelike picture of respondents those eight clusters will be further cross-tabulated (table 20) by age, education, family status, presence of children, job position, net monthly income, number of household members and national socio-economic classification. I now address each of these clusters in turn.

FIGURE 2: Cluster shares

Clust.	Count	% ALL	% ALO
1	710,6	9,3	11,8
2	968,1	12,7	16,0
3	529,7	7,0	8,8
4	811,7	10,7	13,4
5	588,0	7,7	9,7
6	1 034,8	13,6	17,1
7	648,8	8,5	10,7
8	751,0	9,9	12,4
All Q.	6 042,6	79,3	100,0
All R.	7 615,8	100	126,0

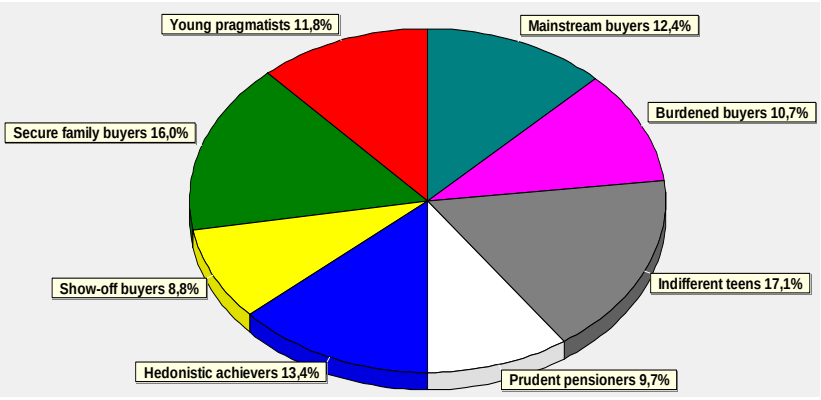

FIGURE 3: Distribution of factors (Y axis) using standardized data over a set of clusters (X axis), where: 1 stands for Young pragmatists, 2 for Secure family buyers, 3 for Show-off buyers, 4 for Hedonistic achievers, 5 for Prudent pensioners, 6 for Indifferent teens, 7 for Burdened buyers, and 8 for Mainstream buyers.

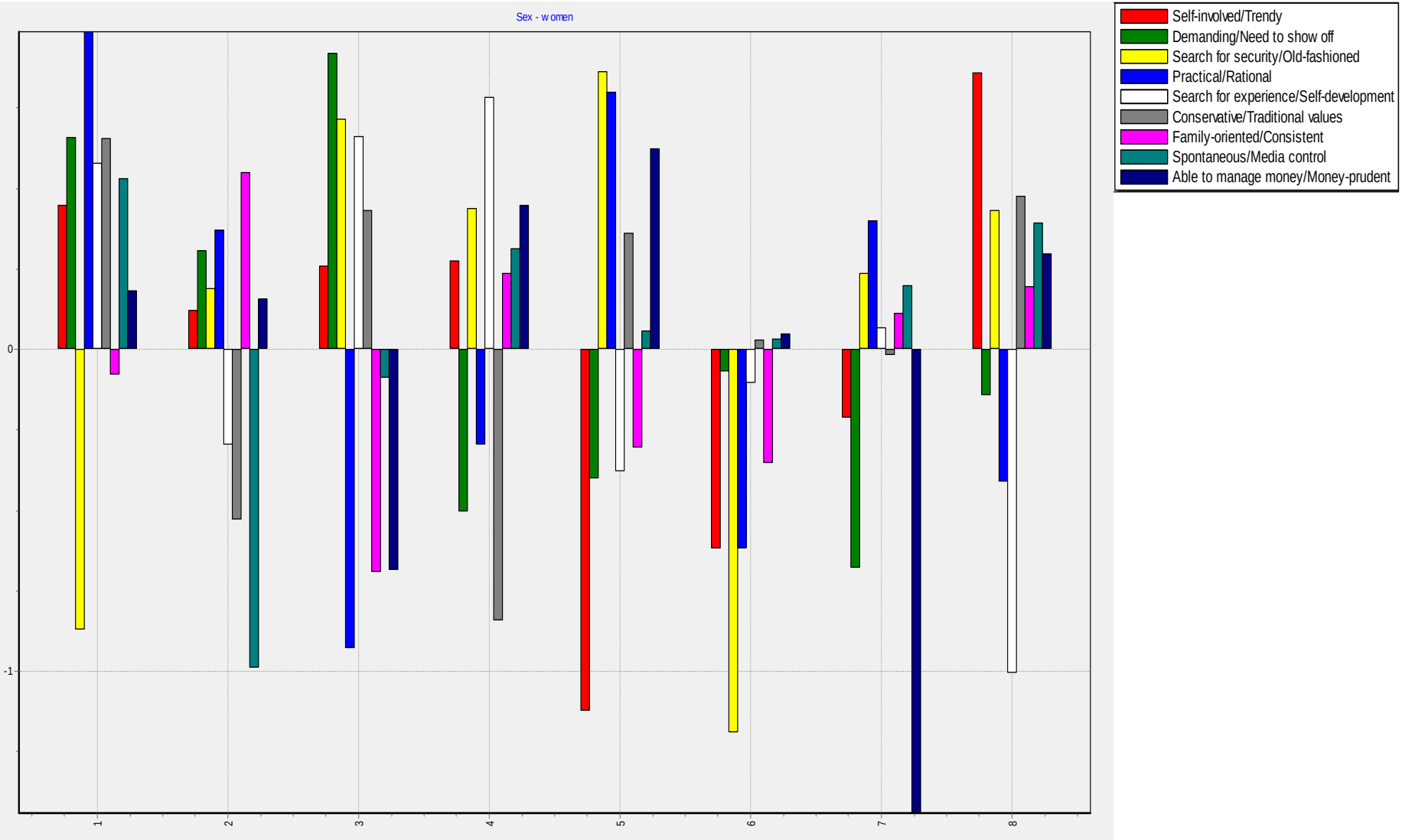

TABLE 19: Contingency table. For further reference on confidence intervals please see table 13.

Respondent´s age	Young pragmatists		Secure family buyers		Show-off buyers		Hedonistic achievers		Prudent pensioners		Indifferent teens		Burdened buyers		Mainstream buyers		TOTAL	
12–19 years	14,1	+ +	2,7	– – –	48,7	+ + +	10,4	0	0,1	– – –	15,1	+ + +	5,1	– – –	2,8	– – –	11,3	0
20–29 years	22,9	+ + +	14,8	0	25,1	+ + +	20,2	+ +	6,4	– – –	17,0	0	13,6	–	11,5	– – –	16,4	0
30–39 years	14,3	–	15,2	–	12,1	– – –	25,6	+ + +	7,3	– – –	19,8	+	20,7	+	20,6	+	17,5	0
40–49 years	17,6	0	17,8	+	6,6	– – –	13,6	0	12,8	0	12,7	–	19,5	+ + +	18,6	+ +	15,1	0
50–59 years	15,9	0	24,0	+ + +	2,5	– – –	16,9	0	15,5	0	15,4	0	18,5	0	24,7	+ + +	17,4	0
60–69 years	10,0	– –	15,6	+	4,0	– – –	10,2	– –	29,9	+ + +	11,9	0	12,0	0	15,8	0	13,6	0
70–79 years	5,2	– – –	9,9	0	1,0	– – –	3,0	– – –	28,1	+ + +	8,1	0	10,5	0	6,1	– –	8,7	0
Respondent´s education																		
primary school	28,1	0	17,5	– – –	51,8	+ + +	19,4	– – –	40,0	+ + +	31,0	0	36,6	+ + +	17,5	– – –	28,6	0
trained / high school without GCE	35,3	0	32,5	0	24,3	– – –	28,0	– – –	41,8	+ + +	33,8	0	37,7	+	40,8	+ + +	34,2	0
high school with GCE	30,3	0	38,2	+ + +	21,6	– – –	37,3	+ + +	16,5	– – –	29,3	0	20,9	– – –	33,2	+	29,6	0
university / college	6,3	0	11,9	+ + +	2,4	– – –	15,3	+ + +	1,7	– – –	5,9	–	4,7	– –	8,4	0	7,6	0
Family status of respondent																		
single	35,8	+ + +	16,3	– – –	68,6	+ + +	27,2	0	8,6	– – –	28,5	+	16,9	– – –	13,2	– – –	25,7	0
married/living as married	43,5	– – –	57,9	+ + +	24,9	– – –	55,7	+	53,1	0	53,0	0	48,5	0	65,4	+ + +	51,6	0
divorced	9,1	0	13,6	+ +	3,1	– – –	11,4	0	11,0	0	7,5	– – –	22,7	+ + +	9,3	0	11,0	0
widow / widower	11,6	0	12,2	0	3,5	– – –	5,6	– – –	27,3	+ + +	11,0	0	11,9	0	12,1	0	11,7	0
Do you have any children?																		
yes	59,0	– – –	79,3	+ + +	31,1	– – –	69,6	0	90,7	+ + +	58,2	– – –	81,4	+ + +	84,3	+ + +	69,7	0
no	41,0	+ + +	20,7	– – –	68,9	+ + +	30,4	0	9,3	– – –	41,8	+ + +	18,6	– – –	15,7	– – –	30,3	0
Job position of the respondent																		
employed/single job/full-time job	49,0	+ + +	43,6	0	31,5	– – –	49,2	+ + +	19,0	– – –	48,3	+ + +	36,2	– –	45,6	+	41,8	0
employed/two and more jobs or be employed and single-handed gainfully employed	0,8	0	1,6	+ +	0	–	1,2	0	0,2	0	1,0	0	0,6	0	0	–	0,8	0
employed/part-time job	1,2	0	3,3	+ + +	0,2	–	1,2	0	0,4	–	0,3	– –	2,1	0	1,7	0	1,4	0
private entrepreneur without employees	0,8	–	2,6	0	0,1	– –	2,7	0	0,3	– –	1,0	–	4,2	+ + +	3,2	+ +	2,0	0
private entrepreneur with employees	1,9	0	1,4	0	0	–	1,7	0	0,8	0	1,1	0	0	– –	1,2	0	1,1	0
unemployed	4,3	0	1,1	– – –	3,2	0	2,4	0	6,5	+ + +	5,1	+ +	5,4	+	2,1	–	3,6	0
leisure pensioner (not working)	18,8	– – –	29,7	0	7,9	– – –	16,0	– – –	66,4	+ + +	23,3	– – –	31,6	+	30,9	+	27,7	0
in the household /maternity(parents) leave	8,5	0	11,4	0	11,6	0	11,6	0	5,3	– – –	6,8	– – –	15,4	+ + +	12,1	0	10,2	0
in full time education	14,7	+ + +	4,1	– – –	45,0	+ + +	12,7	0	0,8	– – –	12,4	0	4,6	– – –	2,4	– – –	10,8	0

other	0	–	1,2	+	0,5	0	1,3	+	0,2	0	0,6	0	0,1	0	0,7	0	0,6	0
Net monthly income of respondent																		
without income	15,2	+ +	5,3	– – –	46,3	+ + +	9,7	0	1,4	– – –	12,1	0	6,2	– – –	4,4	– – –	11,7	0
to 4 000 CZK	1,2	–	1,0	– –	3,6	0	5,0	+ + +	5,0	+ + +	1,7	–	2,1	0	2,9	0	2,7	0
4 001– 6.000 CZK	1,7	–	2,2	0	1,7	0	2,4	0	3,8	0	4,1	0	6,2	+ + +	3,4	0	3,2	0
6 001–8.000 CZK	11,0	– – –	20,2	+ +	12,2	– –	13,9	–	30,0	+ + +	9,5	– – –	27,5	+ + +	12,7	– –	16,7	0
8 001–10.000 CZK	17,3	– –	25,4	+	11,2	– – –	13,1	– – –	33,5	+ + +	23,1	0	28,1	+ + +	27,0	+ +	22,4	0
10 001–12.500 CZK	18,4	0	17,2	0	12,8	–	16,4	0	12,5	–	20,1	+ + +	9,4	– – –	18,3	0	16,1	0
12.501–15.000 CZK	11,3	0	10,1	0	4,2	– – –	12,0	0	6,8	–	13,0	+ +	8,7	0	10,8	0	10,0	0
15.001–17.500 CZK	10,4	+ + +	4,8	–	2,8	– – –	9,2	+ +	2,9	– – –	8,6	+ +	5,8	0	6,0	0	6,5	0
17.501–20.000 CZK	8,6	+ + +	6,0	0	3,2	–	7,6	+ +	2,9	– –	4,6	0	2,5	– –	6,8	0	5,4	0
20.001–25.000 CZK	3,1	0	2,2	0	0,5	– –	5,5	+ + +	0	– – –	1,4	–	1,1	–	5,0	+ + +	2,4	0
25.001–30.000 CZK	0,9	0	1,4	0	0,7	0	3,1	+ + +	1,1	0	1,6	0	1,5	0	2,1	0	1,6	0
30.001–40.000 CZK	0,1	–	2,0	+ + +	0,7	0	1,8	+ +	0	–	0,1	–	1,0	0	0,4	0	0,8	0
40.001–50.000 CZK	0,7	0	1,2	+ + +	0	0	0,3	0	0	0	0,1	0	0	0	0,1	0	0,3	0
50.001–75.000 CZK	0,1	0	1,0	+ + +	0	0	0	0	0	0	0,1	0	0	0	0	0	0,2	0
75.001–100.000 CZK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
more than 100 000 CZK	0,1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of household members																		
1 person	15,1	0	16,5	0	3,8	– – –	9,4	– – –	26,2	+ + +	15,2	0	19,6	+ + +	14,4	0	15,1	0
2 persons	18,8	– – –	31,2	+ + +	15,9	– – –	29,6	+	35,6	+ + +	22,2	– –	24,2	0	28,7	0	26,0	0
3 persons	25,6	0	24,2	0	26,2	0	23,0	0	18,4	– –	24,7	0	17,0	– – –	26,8	+	23,5	0
4 persons	32,4	+ + +	21,1	– – –	35,5	+ + +	25,7	0	11,6	– – –	30,0	+ + +	25,1	0	24,0	0	25,7	0
5 persons and more	8,2	0	7,0	– –	18,6	+ + +	12,3	+ +	8,2	0	7,9	–	14,2	+ + +	6,1	– – –	9,8	0
National socio-economic classification (NS-SEC)																		
A – Higher managerial and professional occup.	8,6	0	13,3	+ + +	6,9	–	18,9	+ + +	0,7	– – –	6,8	– – –	3,8	– – –	15,0	+ + +	9,8	0
B– Lower managerial and professional occup.	4,2	–	9,3	+ + +	6,8	0	9,0	+ + +	3,3	– –	5,2	0	4,6	0	6,2	0	6,3	0
C1–Intermediate occup. (clerical, sales, service)	14,7	+	12,9	0	9,2	–	12,1	0	9,7	–	14,3	+	7,3	– – –	15,0	+	12,3	0
C2–Small employers and own account workers	27,4	+	23,0	0	26,0	0	21,9	0	22,5	0	24,6	0	20,5	0	23,0	0	23,6	0
D–Lower supervisory and technical occup.	21,6	–	24,6	0	28,6	+	20,2	– –	28,9	+	26,3	0	25,6	0	23,4	0	24,7	0
E1–Semi-routine occupations	17,3	0	12,3	– – –	17,5	0	12,4	– –	23,3	+ + +	15,2	0	22,2	+ + +	14,8	0	16,3	0
E2–Routine occupations	4,2	0	2,7	– –	2,2	– –	4,2	0	6,6	+	5,5	0	10,3	+ + +	1,9	– – –	4,6	0
E3 – Never worked and long-term unemployed	2,1	0	1,8	0	2,9	0	1,3	–	5,0	+ + +	2,2	0	5,7	+ + +	0,6	– – –	2,5	0

Interpretation of Clusters

Before exposing to greater detail I would like to point out that following cluster interpretations will be largely defined by dominating factor values (figure 3) and additional demographic information (table 19). By doing this, one shall consider following when interpreting demographics: confidence intervals generated through the test of significance (1); representation (in %) of clusters for given category (2); and that even significant results of (1) and (2) can fail if such interpretation will not be in line with the lifestyle picture of cluster.

TABLE 20: Interpretation of clusters

1. Cluster – YOUNG PRAGMATISTS 11,8 %	
Psychographics	Young singles still living at home, either working (with middle income) or studying. Even though this group is driven by rational attitudes when making purchase decisions, yet they are committed to products/goods that fit their (often demanding) needs to be "different". They are active, spontaneous and favor new experiences. Being affected by family surrounding they are attached to traditional values.
Demographics	Age: 20–29; single with no children; employed/full-time education; income: 15–20 thous (or without income); four persons in the household; NS-SEC: C1/C2.
2. Cluster – SECURE FAMILY BUYERS 16,0 %	
Psychographics	Educated, well-established, woman with family, of high professional status. They are family-oriented, "law and order" seekers preferring balanced life to anything new. When they go shopping pragmatism purchases are what count.
Demographics	Age: 50–59; education: high school/university; married/divorced with children; income: 30–50 thous.; NS-SEC: A/B.
3. Cluster – SHOW-OFF BUYERS 8,8 %	
Psychographics	Dynamic teenage and young adults with limited or no budget craving comfort and dreaming about material wealth even though they cannot afford it. They are the typical "wannahaves" who would love to present themselves through branded, top-quality and expensive products. However, at the same time limited budget restricts them when doing shopping. They are keen to live passionate live, on one hand, but on the other, they enjoy protection in their traditional family structures.
Demographics	Age: 12–29; singles with no children; full-time education; no income; four and more persons in the household, NS-SEC: D

4. Cluster – HEDONISTIC ACHIEVERS 13,4 %	
Psychographics	Young and middle aged, intellectual, ambitious women (living in couples or in families with children) with high level of education and occupational status. They are social, outgoing and search for new experiences, adventure and achievements. Since they are young with high discretionary income, their consumption is alike leisure time driven.
Demographics	Age: 20–39; education: high school/university; married; income: 17,5–30 thous.; NS-SEC: A/B.
5. Cluster – PRUDENT PENSIONERS 9,7 %	
Psychographics	This segment compromises settled seniors in retirement with incomes primarily from superannuation. They are typical security and calmness seekers avoiding any risks and spontaneous actions. They adhere to traditional values, have puritan-conservative attitudes towards shopping and fashion, consume very deliberately, favor domestic products and are money-prudentialists. In their free time they watch TV or listen to the radio. Since they are "empty nests" (according to their household lifecycle), family matters are not more of that importance.
Demographics	Age: 60–79; education: primary school/trained school; widower; unemployed/pensioner; income: 6–10 thous.; one to two persons in the household; NS-SEC: E class.
6. Cluster – INDIFFERENT TEENS 17,1 %	
Psychographics	Uninvolved, disinterested teenagers disregarding common values and stereotypes in the society (negative factors). When interpreting this cluster, account shall be primarily taken of the young age of respondents explaining their low self-esteem, rejection of any conventional, and unconcern for consumption issues.[1] Their lives can combine dynamic as well as calm elements, that is, it simply depends on their own taste.
Demographics	Age: 12–19; single; four persons in the household;

[1] However, we should not neglect the fact that negative values of factors within this cluster may be resulting from rash and unconscientious filling of the questionnaire.

7. Cluster – BURDENED BUYERS 10,7 %	
Psychographics	This group involves women of matured, simple, tradition oriented families living at the lowest level of subsistence (often dependent on the state welfare). When they are not on maternity leave they work as casual grade workers, facing employment problems and frequent divorces. Low discretionary income does not allow them to make ends meet or to put money aside. As low print consumers they are rational when comes to shopping (using discounts to greater extent) and due to unsecure life they search after security and financial independence.
Demographics	Age: 40–49; education: primary school/trained school; married/divorced with three and more children; on maternity leave; income: 4–10 thous.; NS-SEC: E class.
8. Cluster – MAINSTREAM BUEYERS 12,4 %	
Psychographics	Mature and pre-retiree women with family, of clerical occupation, middle income and level of education. Eighth cluster embodies working, traditionally oriented woman, enjoying peaceful life. She has a good self-esteem, likes nice thinks, is trend-conscious and shops for pleasure. Since her work and family fills most of her time, there is not much left for hobbies and social life.
Demographics	Age: 40–59; education: trained school; married with children; income: 20–25 thous.; three persons in the household; NS-SEC: C1.

13 MULTIDIMENSIONAL SCALING

Recall that the objective of thesis is to verify hypothesis whether Czech females embodies rather puritan attitudes with rising materialistic tendencies. To do so, first and foremost factor analysis was employed to decrease the large battery of initial statements to lower number of more meaningful factors. In next stage, cluster analysis (and contingency tables) was carried out to build up portrayals of segments. However, in order to visually produce mutual linkages between segments additional technique, known as multidimensional scaling, ought to be performed.

MDS enables us to visualize the organization of single segments in two-dimensional "landscape map". This map allows us to explain similarities or dissimilarities (based on Euclidean distances) between clusters. That is, MDS computes coordinates of clusters resulting from proximity matrix (table 17) and projects them as single points in two-dimensional plane (figure 5).[1] Then, the poles of attraction dividing (or grouping) those clusters need to be named. By doing so, the most marginal variables[2] on the map shall be considered as most mathematically significant for interpretation (i.e. labeling) of axes.[3]

How to Read in the Map

On every map[4] the clusters that are alien to one another (see, for instance, cluster "Show-off buyers" and "Prudent pensioners") can be interpreted as antagonistic and radically opposed lifestyles (i.e. 90 % of their responses were opposed). In contrast, neighboring clusters (see, for instance, cluster "Secure family buyers" and "Prudent pensioners"), whatever their origin and composition, can be interpreted as similar (i.e. 80 % of their responses were same).

Two clusters can also be positioned on the same pole of axis accounting for their similarity and at the same time on two opposite poles of another axis (see, for instance, cluster "Burdened buyers" and "Mainstream buyers") accounting for their dissimilarity (i.e. 50 % of responses were same and 50 % different).

As it is obvious from figure 5 the hypothesis holds only partly. Two most prevailing stereotypes in the Czech society (based on the cumulation of clusters in the south-west and south-east of the map) are those which are driven by the materialistic need *to have* and those which are driven by the conservative *need for stability*. However, as it was demonstrated, population is rather prone to the materialistic trend than do for the conservative one.

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[1] The stress criterion (*Phi*) for given clusters in two-dimensional space is 0,4. Even though this is not a low value we need to consider the fact that initial 9-dimensional factor space cannot be reduced into two-dimensional without loss of information.

[2] The variables in the centre of the map would be significant, if we decided for 3- or 4-dimensional space.

[3] Auxiliary map of initial manifest variables (considering only "definitely yes" answers) might assist interpretation of axes (attachment E).

[4] Following methodology was suggested by Cathelat (1993).

More precisely, the lifestyles ("Prudent pensioners" and "Secure family buyers") which correspond to the west pole of axis focus primarily on the stability. They are further characterized by the need for security, peaceful life, timeliness (since they are not fashion-conscious) and strong conservatism.

The lifestyle ("Show-off buyers") on the opposite end, the east pole, reflects antagonistic need to change. Its mindset leans toward modernism, trend and tendency to risk-taking. The south lifestyle ("Hedonistic achievers") feature primarily materialistic need to have. They are consumerists, family-oriented; their need is rather to converge and they show collectivistic tendencies.

The antagonistic lifestyles ("Young pragmatists" and "Indifferent teens") on the top pole in the north are defined by the need to be and pragmatic consumption. They are self-oriented, their need is rather to diverge and they cling to individualism.

As those clusters emerge on margins of the map interpretation of their position is more straightforward than for clusters "Mainstream buyers" and "Burdened buyers". Since those segments are plotted between two axes they possess characteristics of both poles.

However, another factor accounting for groupings of clusters has turned up – age. As we can see the middle aged population occurs on the south pole of axis, 50+ population on the east while young respondents on the west. Figure 4 and 5 sketches all those illustrations.

FIGURE 4: Antagonistic needs and values

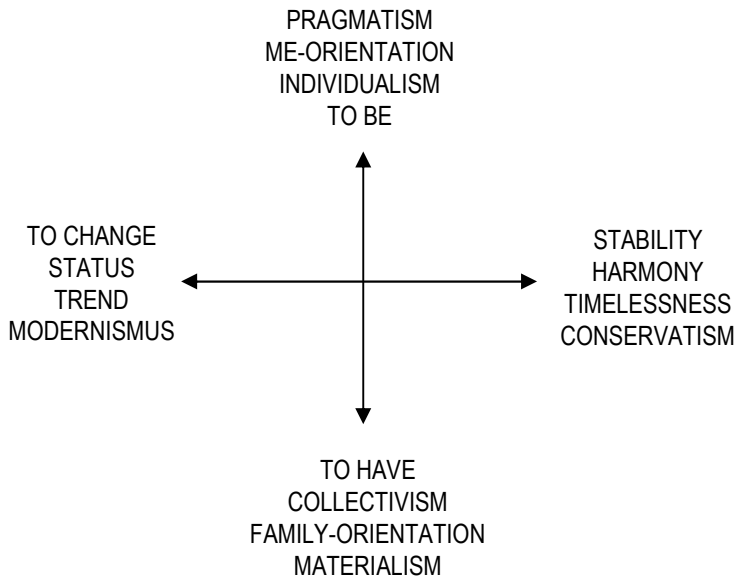


Figure 6 brings another graphical representation[1] of social map (applied merely to hypothesized clusters) where vertical axis stands for social class and horizontal axis for basic orientation of clusters.

[1] This methodology was suggested by Sinus Sociovision.

FIGURE 5: Positioning map of clusters within antagonistic needs. For further reference on axes please see chapter 13 Multidimensional Scaling, part "How to Read in the Map".

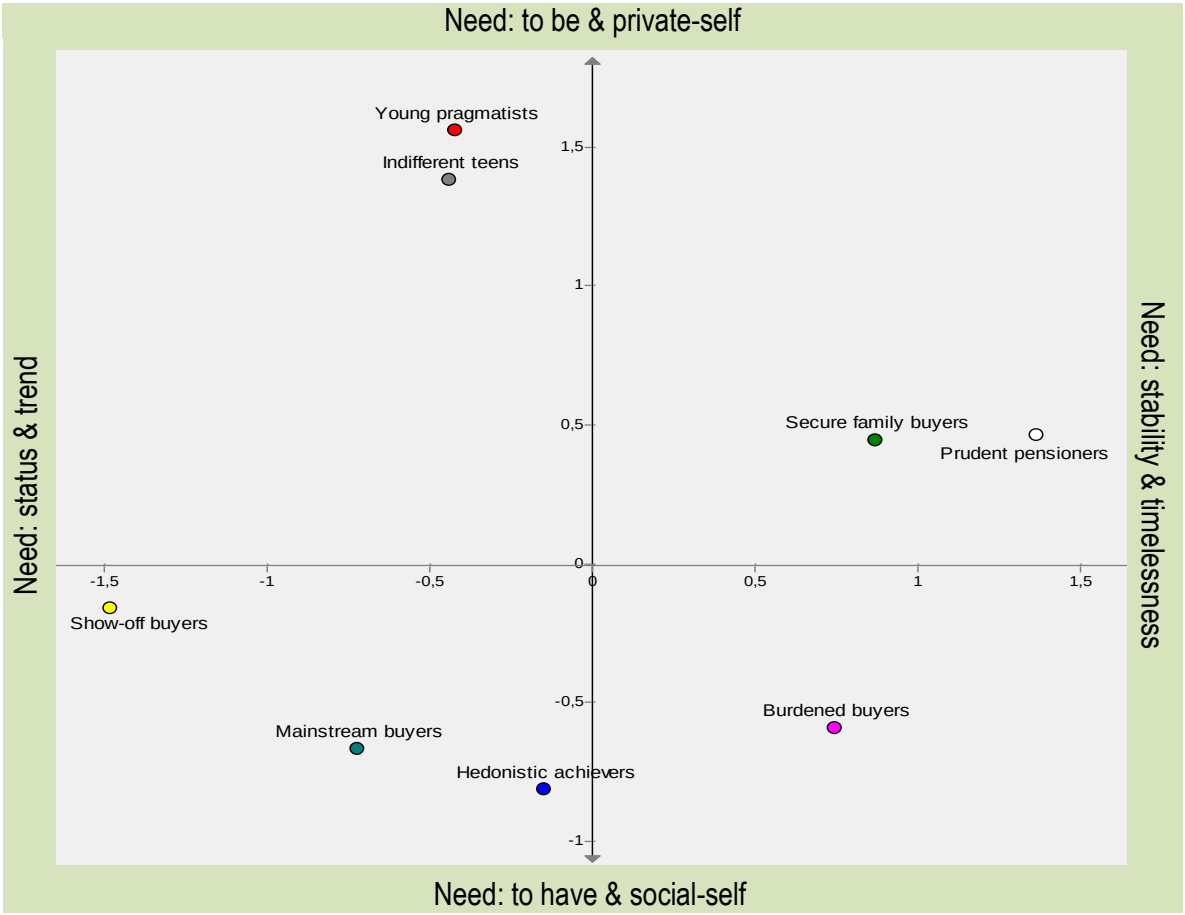
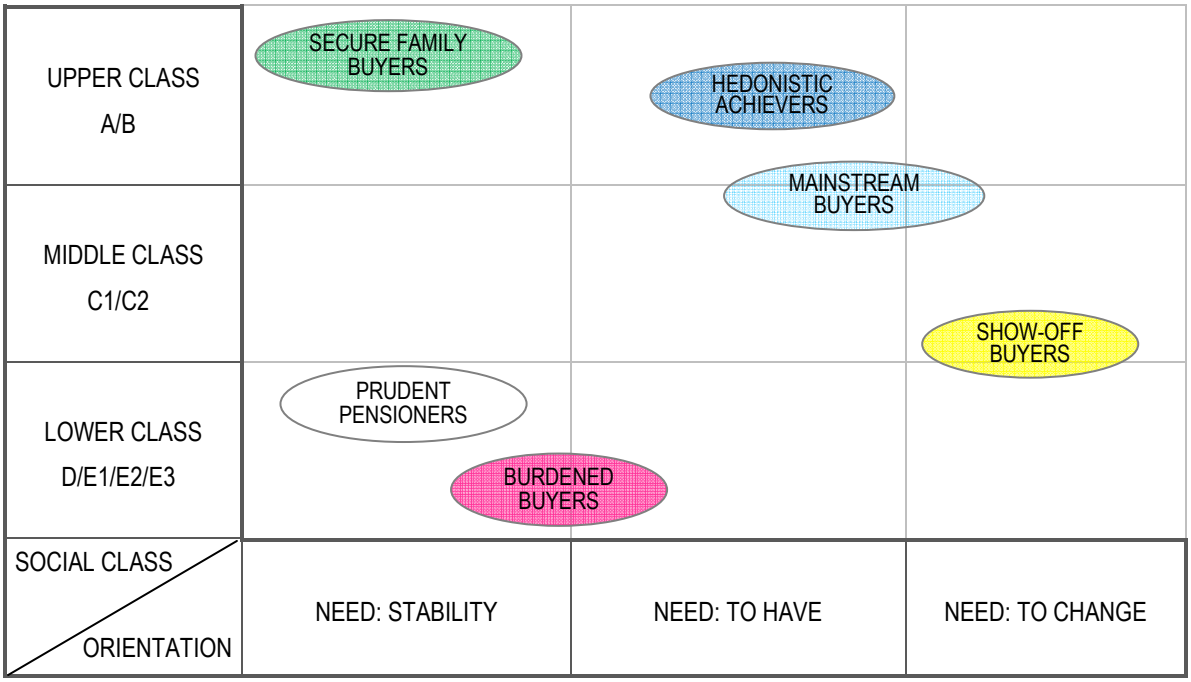


FIGURE 6: Positioning map of clusters within social classes (i.e. NS-SEC variable on Y axis) and basic orientation (i.e. need on X axis).



14 MARKETING IMPLEMENTATION

The applications of lifestyle typologies range from positioning issues through concept and product development to optimization of communication strategies and media planning. With these steps in mind, let me consider a hypothetical case study of company which decides to target new apparel line (adapted from (O'Connor, 1997)).

Targeting the Group

Based on results of previous analysis the company has chosen the Show-off buyer to be targeted. Following illustrations are those to be taken into account:

A. The Show-off buyer is very committed to buying innovative and attractive-looking goods.
B. She is brand-aware but not loyal. She believes that branded and expensive goods can push up her self-esteem and status.
C. She believes that high-price and brand guarantees a good quality.
D. Her budget is limited.
E. The show-off buyer is often influenced by advertising, nice wrappings or goods recommended by specialists.
F. The show-off buyer is young, seeks emotional fulfillment, is social and outgoing.
G. She loves to present herself in a way which cultivates her status and makes her feel good about herself (i.e. to achieve the ideal self-concept).

Targeting the Creative Strategy

The recommended message(s) to be communicated by the advertising is:
"Affordable, top-branded and innovative-looking products make you feel good about yourself."
"You don't have to pay more for a good feeling!"
As Show off buyer is outgoing one might also consider showing a social event with friends.

Targeting the Product

New product development should enhance the modern, innovative and attractive-looking attributes of clothes perceived as the most appealing to this segment. The clothes shall be youthful and look up to date and. However, additional study needs to be conducted in order to gain more information on product benefits, preferences, likes and dislikes regarding style, fabrics and color (i.e. to segment on unobservable product-specific variables).

Targeting the Media

The company employs as media targeting print since women's magazines, often grouped by editorial content (fashion, free time, lifestyle…), are more likely to reach the audience than broadcasting. Nevertheless, additional study regarding media exposure would provide further guidance.

15 EVALUATION OF RESEARCH OBJECTIVES

RESEARCH QUESTIONS

RQ1: Who are the leading players in the Czech (apparel) market?
The leading players in the Czech apparel market are Indifferent teens and Secure family buyers.

RQ2: What are the fundamental values/needs in the Czech society?
The fundamental values/needs in the Czech society are:

- The traditional need after stability & harmony,
- The modern need to change & to be trendy,
- The materialistic need to have & the need after social-self,
- The post-materialistic need to be & the need after private-self.

RQ3: What are the profiles of Czech women?
Addressed in chapter 11 Cluster Analysis, p. 48–50.

RQ4: Which profiles can and which cannot be combined in a single product?
Neighboring profiles as: Secure family buyers, Prudent pensioners, Burdened buyers; or Show-off buyers, Mainstream buyers, Hedonistic achievers; or Young pragmatists, Indifferent teens can be combined in a single product since they originate from the same family-lifestyles.
However, antagonistic lifestyles as depicted in FIGURE 5, p.53 shall not be combined.

RQ5: Which message shall be communicated to the target segment?
TG: Show-off buyers
"Affordable, top-branded and innovative-looking products make you feel good about yourself."
"You don't have to pay more for a good feeling!"

HYPOTHESIS

Ho: Czech population embodies rather puritan-conservative attitudes with slightly rising materialistic tendencies.
Ho is rejected since Czech women in the apparel industry rather cling to materialistic values than do for the traditional ones.

PART VI: DISCUSSION

Most of discussion in this section attempts at evaluation of suggested solution in a confrontation with results and findings of other approaches. The concluding part will be, in addition, devoted to the possible extensions of suggested solution.

As in any other research, the departure point of data collection is questionnaire design. Not surprisingly, every survey researcher has to face common dilemma of interviewing, that is, how to increase the quantity and quality of gathered information and at the same time decrease the incurred costs per respondent. Adaptive (also termed as tailored) interviewing may resolve this impediment. *Tailored interviewing* procedure is rooted in item response theory (IRT) which suggests prior testing of questionnaire items on a sample of respondents by the method of maximum likelihood. The estimate parameters are then used in subsequent interviews. Put simply, the subsequent interviews are tailored to each respondent, in which s/he has to answer only those questions that capture the most essence of his/her trait. As a result, rapid decrease of questionnaire items (and thereby respondent burden and fatigue) together with interviewing costs may be achieved (Wedel, et al., 1998).

Another "imperfection" of segmentation theory is the implicit assumption that consumers are to diverge among segments and converge within segments. Such assumption implies discrete distribution across homogenous segments ignoring any inherent differences across consumers. Hence, several authors call for continuous (unimodal) distribution of consumer responses to marketing mix, employing the method of *Bayesian estimation* (Wedel, et al., 1998).

As argued earlier, the purpose of factor analysis is the elimination of manifest variables facilitating interpretation of results. However, if we decided to go further in elimination of variables, we could either subject retained factors to new factor rotation (i.e. we would conduct factor analysis of second order), although this is rare; or we could opt for another method – *canonical analysis*. Broadly speaking, factor analysis results in certain number of mixed factors, some relative to explanatory variables (as opinions and perceptions), the others to explained variables (as behavior, purchasing intentions, preferences). However, factor analysis does not provide us with the distinction which factors are explanatory and which explaining. This information can be revealed by means of canonical analysis (or precisely by canonical scores) which summarizes the relationships between explanatory and explained variables. Owing to this, canonical analysis results in even smaller number of canonical factors (Cathelat, 1993; Marcoulides, et al., 1997).

For the purpose of my thesis, the MDS method of graphical configuration of segments was proposed. Nevertheless, without any limitations, MDS could be substituted by another technique of visual display, that is, by *multiple correspondence analysis*. MCA is likewise able to plot associations (here, amongst rows – respondents and columns – characteristics) in two-dimensional plane (Greenacre, 1993). The decision for application of MCA instead of MDS is rather arbitrary (usually affected by programs being available).

Throughout the whole thesis, the focus was rather put on segmentation of customers in terms of lifestyles and values, and construction of their profiles (first level of segmentation). However, it appears promising to study how different profiles are attracted to different products and services (second level of segmentation) or to different brands (third level of segmentation).[1] Techniques as MDS, MSA, SEM, conjoint analysis or multinomial logit model may resolve those considerations and jointly with cross-cultural segmentation, for instance, may extend the current research not only in size but also in scope (i.e. definition of relevant market ought to be revised).

Agenda for Future Research

To sum it up, future research efforts should focus on following areas (Wedel, et al., 2003):

A. Development of new data collection techniques that pose less burden on respondents while still enhancing quality of data.

B. Development of data analysis techniques that combine discrete and continuous variables.

C. Discovery of new segmentation bases and techniques that allow for simultaneous grouping of both consumers and products/services/brands into classes.

D. Finally, development of models that integrate data analysis, targeting and positioning (of all 4P's) leading to decisions that are based on managerial objectives rather than on statistical fit.

[1] Second and third level of segmentation is commonly referred to as response-based segmentation.

PART VII: CONCLUSSION

The concluding part ties all preceding chapters in a comprehensive overview aimed at description of key-aspects of the thesis.

The theoretical part is intended at outline of lifestyle and segmentation concepts. The former is concerned in investigating of all variables determining consumer behavior, namely, lifestyle variables (i.e. AIOs) and self-concept variables, either contributing to the formation of attitudes, values and needs – last elements in a consumption process. The latter deals with formulation of criteria critical for effective segmentation and description of segmentation process in seven steps which can assist managers when implementing segmentation in practice.

The methodological part presents research process decomposed into sequence of steps to be conducted. Having announced the research objectives, in next step the decision to apply the design of descriptive longitudinal studies (exploiting the panel data) was taken. Given the need of sample representativeness in population, the procedure of stratified sampling of municipalities, random sampling of households and quota sampling of respondents was pursued. After the data had been collected (by means of person- and self-administered surveys), edited and coded, they were subjected to factor analysis, cluster analysis, contingency tables and multidimensional scaling, respectively.

The practical part is focused on execution of aforementioned multivariate statistical methods along with interpretation of its results. In first step, principal component analysis carried out extraction of factors from which nine were retained. Those retained factors were then orthogonally rotated (by means of varimax) in order to reveal so called "simple structure", facilitating interpretation of factors. The goal of interpretation was to detect attitudes, motivations, needs and stereotypes attributed to each of those nine factors. In second step, cluster analysis, partitioning of respondents (by k-means technique) was executed. Driven by the research objective to establish segments of females in the apparel industry, following clusters (in successive order) have been generated: Indifferent teens, Secure family buyers, Hedonistic achievers, Mainstream buyers, Young Pragmatists, Burdened buyers, Prudent pensioners, and Show-off buyers. In third step those clusters were cross-tabulated by basic demographic information. Finally, MDS summarized all results in two-dimensional map grouping (or dividing) formed segments into four poles of attraction, each corresponding to one prevailing value system in the society.

After interpretation and spatial organization of clusters had been accomplished, the most involved segment within apparel industry, the Show-off buyer, was decided to be targeted. Ultimately, the advertising message to be communicated was proposed.

To conclude, the thesis aimed at organization of the largest possible quantity of information into the most synthetic model while still enhancing an acceptable balance between the loss of information and interpretability of data.

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LIST OF TABLES AND FIGURES

ATTACHMENTS

A: QUESTIONNAIRE

FINANCE

681 I can always make ends meet.

684 Money can buy almost everything today.

685 I save money regularly.

686 I feel always a bit sorry when I have to spend money.

688 One of the most fundamental preconditions of a happy life is to have enough money.

698 I have got lots of things others can envy me.

702 I would like to save money but it is very hard.

705 I borrow money and do not care much about the ends.

SELF-EVALUATION

337 I live to enjoy my life.

341 In my life I would like to achieve as most knowledge and wisdom as I can.

344 My major life objective is to take care about my family.

349 I would like to achieve in my life a high rank position.

360 I like order and organization in all my belongings.

368 I often procrastinate - I do my tasks at the latest.

370 I would like to make only as much money as I need for my life.

381 I like changes - I need to switch from the routine life.

397 I cling to traditional values.

EVALUATION OF CURRENT HAPPINGS

213 The government should guarantee reasonable living standards for everyone.

222 Private enterprise ensures further growth of our society.

224 The decline of our society can be put to a halt only by enforcing more strict laws.

355 I am self-confident enough.

361 Today´s society is oriented too much to consumption.

374 The principles of Christianity hold perpetually.

376 Everyone should be responsible of his/her well-being.

LIFE & FAMILY & CHILDREN

385 You can learn about a man when seeing a car he drives.

620 I consider marriage as an anachronism.

621 When it comes to priorities a woman always should put her family before her career.

627 It is men´s task to ensure financial means for the family.

630 Household work should be done preferably by women.

632 The most important family matters should be decided primarily by the husband/father.

636 Partner relationships are too permissive nowadays.

LEISURE TIME

523 It is important for me to spend my free time with my children.

524 In my free time it is important for me to do something useful.

525 In my free time it is important for me to have fun.

526 In my free time it is important for me to meet new people - find new places.

527 It is important for me to spend my free time on doing my hobbies.

545 I often watch TV or listen to the radio in my free time.

SHOPPING

001 I prefer brand products.

002 I am often influenced by advertising when doing my choice of products.

004 I prefer buying foreign products.

005 The attractive looks and nice wrapping are the most important features of products.

006 I prefer innovative-looking products.

007 I buy Czech products as much as I can.

008 I don´t care about brand when shopping - I just take into account the type of product.

010 The most important thing about goods is its real utility value.

011 Good brand is a guarantee of a high quality.

012 The quality of Czech products is not always good.

013 When shopping I often buy something I have never bought before.

015 It's worth paying more for quality products.

016 I often buy something that I don´t really need.

018 When doing a major shopping I prepare a shopping list in advance.

019 I use discounts as much as I can.

020 I often buy something just to make myself happy.

021 If I find a brand which suits me I do not look for a change.

022 I buy top-quality products only.

024 I usually like quite expensive goods.

025 I choose goods recommended by specialists.

028 Higher price guarantees higher quality.

029 I like trying new brands.

036 I like buying clothing.

037 I got used to certain range of products which I only buy.

038 Quality products are always more expensive.

039 I like to buy nice things.

041 At present the market is well supplied with products.

739 I often buy goods that is propagated directly in shop

CLOTHING

300 I prefer buying more expensive but better quality clothing.

301 It takes me quite a long time to choose clothing items which really suit me.

309 I prefer tailor-made clothing.

310 I dress in such way to be liked by the others.

311 Women should always look good.

312 I have plenty of clothes.

314 I like to dress casually.

316 I need just a few pieces of clothing.

318 When it comes to fashion I am usually a step ahead of other people.

323 My job requires to be well-dressed.

324 When it comes to clothing I have a very good taste.

326 I like to dress inconspicuously.

330 One of my life principles is to be well-dressed.

333 It is very important for me how I am dressed / how I look.

334 Clothes should be primarily practical and comfortable.

336 Buying new clothes before the old one is completely used up is unnecessary.

LIKERT SCALE

05 Definitely no

04 Rather no

03 Neither yes nor no

02 Rather yes

01 Definitely yes

06 N/A

DEMOGRAPHICS

Respondent´s age 12-19 years

20-29 years

30-39 years

40-49 years

50-59 years

60-69 years

70-79 years

Respondent´s education

primary school

trained / high school without GCE

high school with GCE

university / college

Family status of respondent

single

married/living as married

divorced

widow / widower

Do you have any children?

Yes/No

Job position of the respondent

employed / single job / full-time job

employed/two and more jobs or be employed and single-handed gainfully employed

employed/part-time job

private entrepreneur(owner/co-owner of company) without employees

private entrepreneur(owner/co-owner of company) with employees

unemployed

leisure pensioner (not working)

in the household /maternity(parents) leave

in full time education

other

Net monthly income of respondent

without income

to 4 000 CZK

4 001 - 6.000 CZK

6 001 - 8.000 CZK

8 001 - 10.000 CZK

10 001 - 12.500 CZK

12.501 - 15.000 CZK

15.001 - 17.500 CZK

17.501 - 20.000 CZK

20.001 - 25.000 CZK

25.001 - 30.000 CZK

30.001 - 40.000 CZK

40.001 - 50.000 CZK

50.001 - 75.000 CZK

75.001 - 100.000 CZK

more than 100 000 CZK

Number of household members

1 person

2 persons

3 persons

4 persons

5 persons and more

National socio-economic classification

A – Higher managerial and professional occup.

B– Lower managerial and professional occup.

C1–Intermediate occup. (clerical, sales, service)

C2–Small employers and own account workers

D–Lower supervisory and technical occup.

E1–Semi-routine occupations

E2–Routine occupations

E3 – Never worked and long-term unemployed

B: RESPONSE RATE

	Weighted	Non-weighted
Total number of respondents	7615,8	8050
Responded to at least on question (ALO)	7606,2	8035
Responded to all questions	6042,6	6474
Response rate - all questions	79,30%	

C: EXTRACTED COMPONENTS

	Initial eigenvalues			Unrotated factors			Rotated factors		
Factor number	Eigenvalue	% of variance	Cumulative %	SS f. loadings	% of variance	Cumulative %	SS f. loadings	% of variance	Cumulative %
1	10,879	13,43	13,43	10,879	13,43	13,43	5,956	7,35	7,35
2	7,092	8,76	22,19	7,092	8,76	22,19	5,312	6,56	13,91
3	3,882	4,79	26,98	3,882	4,79	26,98	4,742	5,85	19,77
4	2,579	3,18	30,16	2,579	3,18	30,16	3,917	4,84	24,60
5	2,195	2,71	32,87	2,195	2,71	32,87	3,013	3,72	28,32
6	2,009	2,48	35,35	2,009	2,48	35,35	2,992	3,69	32,01
7	1,613	1,99	37,34	1,613	1,99	37,34	2,857	3,53	35,54
8	1,532	1,89	39,23	1,532	1,89	39,23	2,642	3,26	38,80
9	1,513	1,87	41,10	1,513	1,87	41,10	1,863	2,30	41,10
10	1,407	1,74	42,84	—	—	—	—	—	—
11	1,380	1,70	44,54	—	—	—	—	—	—
12	1,304	1,61	46,15	—	—	—	—	—	—
13	1,222	1,51	47,66	—	—	—	—	—	—
14	1,195	1,48	49,14	—	—	—	—	—	—
15	1,159	1,43	50,57	—	—	—	—	—	—
16	1,102	1,36	51,93	—	—	—	—	—	—
17	1,046	1,29	53,22	—	—	—	—	—	—
18	1,021	1,26	54,48	—	—	—	—	—	—
19	0,968	1,20	55,67	—	—	—	—	—	—
20	0,955	1,18	56,85	—	—	—	—	—	—
21	0,938	1,16	58,01	—	—	—	—	—	—
22	0,932	1,15	59,16	—	—	—	—	—	—
23	0,911	1,12	60,29	—	—	—	—	—	—
24	0,910	1,12	61,41	—	—	—	—	—	—
25	0,882	1,09	62,50	—	—	—	—	—	—
26	0,849	1,05	63,55	—	—	—	—	—	—
27	0,831	1,03	64,57	—	—	—	—	—	—
28	0,818	1,01	65,58	—	—	—	—	—	—
29	0,794	0,98	66,56	—	—	—	—	—	—
30	0,783	0,97	67,53	—	—	—	—	—	—
31	0,767	0,95	68,48	—	—	—	—	—	—
32	0,756	0,93	69,41	—	—	—	—	—	—
33	0,741	0,92	70,33	—	—	—	—	—	—
34	0,734	0,91	71,23	—	—	—	—	—	—
35	0,725	0,90	72,13	—	—	—	—	—	—
36	0,714	0,88	73,01	—	—	—	—	—	—
37	0,707	0,87	73,88	—	—	—	—	—	—
38	0,675	0,83	74,72	—	—	—	—	—	—
39	0,667	0,82	75,54	—	—	—	—	—	—
40	0,663	0,82	76,36	—	—	—	—	—	—
41	0,648	0,80	77,16	—	—	—	—	—	—
42	0,637	0,79	77,94	—	—	—	—	—	—

	Initial eigenvalues			Unrotated factors			Rotated factors		
Factor number	Eigenvalue	% of variance	Cumulative %	SS f. loadings	% of variance	Cumulative %	SS f. loadings	% of variance	Cumulative %
43	0,629	0,78	78,72	—	—	—	—	—	—
44	0,612	0,76	79,47	—	—	—	—	—	—
45	0,603	0,74	80,22	—	—	—	—	—	—
46	0,591	0,73	80,95	—	—	—	—	—	—
47	0,589	0,73	81,67	—	—	—	—	—	—
48	0,579	0,71	82,39	—	—	—	—	—	—
49	0,573	0,71	83,10	—	—	—	—	—	—
50	0,564	0,70	83,79	—	—	—	—	—	—
51	0,554	0,68	84,48	—	—	—	—	—	—
52	0,546	0,67	85,15	—	—	—	—	—	—
53	0,534	0,66	85,81	—	—	—	—	—	—
54	0,531	0,66	86,46	—	—	—	—	—	—
55	0,521	0,64	87,11	—	—	—	—	—	—
56	0,508	0,63	87,73	—	—	—	—	—	—
57	0,495	0,61	88,35	—	—	—	—	—	—
58	0,484	0,60	88,94	—	—	—	—	—	—
59	0,482	0,59	89,54	—	—	—	—	—	—
60	0,474	0,58	90,12	—	—	—	—	—	—
61	0,472	0,58	90,71	—	—	—	—	—	—
62	0,460	0,57	91,27	—	—	—	—	—	—
63	0,442	0,55	91,82	—	—	—	—	—	—
64	0,435	0,54	92,36	—	—	—	—	—	—
65	0,431	0,53	92,89	—	—	—	—	—	—
66	0,429	0,53	93,42	—	—	—	—	—	—
67	0,422	0,52	93,94	—	—	—	—	—	—
68	0,411	0,51	94,45	—	—	—	—	—	—
69	0,400	0,49	94,94	—	—	—	—	—	—
70	0,396	0,49	95,43	—	—	—	—	—	—
71	0,388	0,48	95,91	—	—	—	—	—	—
72	0,377	0,47	96,37	—	—	—	—	—	—
73	0,370	0,46	96,83	—	—	—	—	—	—
74	0,364	0,45	97,28	—	—	—	—	—	—
75	0,356	0,44	97,72	—	—	—	—	—	—
76	0,345	0,43	98,15	—	—	—	—	—	—
77	0,339	0,42	98,56	—	—	—	—	—	—
78	0,326	0,40	98,97	—	—	—	—	—	—
79	0,293	0,36	99,33	—	—	—	—	—	—
80	0,284	0,35	99,68	—	—	—	—	—	—
81	0,261	0,32	100,00	—	—	—	—	—	—
TOTAL	81,000	100,00							

D: COMMUNALITIES

Communalities	
001 I prefer brand products.	0,558
002 I am often influenced by advertising when doing my choice of products.	0,369
004 I prefer buying foreign products.	0,442
005 The attractive looks and nice wrapping are the most important features of products.	0,376
006 I prefer innovative-looking products.	0,512
007 I buy Czech products as much as I can.	0,449
008 I don´t care about brand when shopping - I just take into account the type of product.	0,462
010 The most important thing about goods is its real utility value.	0,387
011 Good brand is a guarantee of a high quality.	0,473
012 The quality of Czech products is not always good.	0,222
013 When shopping I often buy something I have never bought before.	0,473
015 It's worth paying more for quality products.	0,493
016 I often buy something that I don´t really need.	0,529
018 When doing a major shopping I prepare a shopping list in advance.	0,305
019 I use discounts as much as I can.	0,475
020 I often buy something just to make myself happy.	0,464
021 If I find a brand which suits me I do not look for a change.	0,245
022 I buy top-quality products only.	0,493
024 I usually like quite expensive goods.	0,402
025 I choose goods recommended by specialists.	0,445
028 Higher price guarantees higher quality.	0,459
029 I like trying new brands.	0,476
036 I like buying clothing.	0,504
037 I got used to certain range of products which I only buy.	0,309
038 Quality products are always more expensive.	0,434
039 I like to buy nice things.	0,476
041 At present the market is well supplied with products.	0,386
213 The government should guarantee reasonable living standards for everyone.	0,308
222 Private enterprise ensures further growth of our society.	0,230
224 The decline of our society can be put to a halt only by enforcing more strict laws.	0,295
300 I prefer buying more expensive but better quality clothing.	0,557
301 It takes me quite a long time to choose clothing items which really suit me.	0,263
309 I prefer tailor-made clothing.	0,325
310 I dress in such way to be liked by the others.	0,534
311 Women should always look good.	0,552
312 I have plenty of clothes.	0,424
314 I like to dress casually.	0,326
316 I need just a few pieces of clothing.	0,504
318 When it comes to fashion I am usually a step ahead of other people.	0,552
323 My job requires to be well-dressed.	0,441
324 When it comes to clothing I have a very good taste.	0,512
326 I like to dress inconspicuously.	0,391
330 One of my life principles is to be well-dressed.	0,598
333 It is very important for me how I am dressed / how I look.	0,604
334 Clothes should be primarily practical and comfortable.	0,410
336 Buying new clothes before the old one is completely used up is unnecessary.	0,450
337 I live to enjoy my life.	0,393
341 In my life I would like to achieve as most knowledge and wisdom as I can.	0,409

344 My major life objective is to take care about my family.	0,459
349 I would like to achieve in my life a high rank position.	0,436
355 I am self-confident enough.	0,253
360 I like order and organization in all my belongings.	0,403
361 Today´s society is oriented too much to consumption.	0,195
368 I often procrastinate - I do my tasks at the latest.	0,320
370 I would like to make only as much money as I need for my life.	0,304
374 The principles of Christianity hold perpetually.	0,229
376 Everyone should be responsible of his/her well-being.	0,255
381 I like changes - I need to switch from the routine life.	0,423
385 You can learn about a man when seeing a car he drives.	0,403
397 I cling to traditional values.	0,326
523 It is important for me to spend my free time with my children.	0,393
524 In my free time it is important for me to do something useful.	0,401
525 In my free time it is important for me to have fun.	0,577
526 In my free time it is important for me to meet new people - find new places.	0,557
527 It is important for me to spend my free time on doing my hobbies.	0,332
545 I often watch TV or listen to the radio in my free time.	0,256
620 I consider marriage as an anachronism.	0,447
621 When it comes to priorities a woman always should put her family before her career.	0,397
627 It is men´s task to ensure financial means for the family.	0,391
630 Household work should be done preferably by women.	0,552
632 The most important family matters should be decided primarily by the husband/father.	0,537
636 Partner relationships are too permissive nowadays.	0,294
681 I can always make ends meet.	0,502
684 Money can buy almost everything today.	0,326
685 I save money regularly.	0,500
686 I feel always a bit sorry when I have to spend money.	0,224
688 One of the most fundamental preconditions of a happy life is to have enough money.	0,390
698 I have got lots of things others can envy me.	0,328
702 I would like to save money but it is very hard.	0,348
705 I borrow money and do not care much about the ends.	0,447
739 I often buy goods that is propagated directly in shop	0,396

E: MULTIDIMENSIONAL SCALING OF MANIFEST VARIABLES