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Engineering Sciences

Технические науки

The Association of Serum Adiponectin Level with Type Two Diabetes Mellitus in Some Iraqi Patients

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Abstract. Adiponectin is a 244 – amino acid-long polypeptide, that acts as a hormone with anti-inflammatory and insulin sensitizing properties. serum adiponectin level correlates inversely with insulin resistance, and hypoadiponectinemia being is found in subjects with obesity or type 2 diabetes mellitus. The aim of the present study is to study the association of serum adiponectin level with the risk of type two diabetes mellitus. Sixty six diabetic patients and Twenty five controls were enrolled in this study. Adiponectin levels were significantly reduced in T2DM patients than in control group with mean and standard error of 8.98 ± 0.86µg/ml vs. 12.51 ± 1.53µg/ml, respectively. Adiponectin levels were significantly reduced in T2DM patients male with a mean and standard error of 5.58 ± 0.64 µg/ml more than that of female (10.95 ± 1.22 µg/ml).

Keywords: serum adiponectin; diabetes mellitus; Iraqi patients.

Introduction.

Type 2 diabetes mellitus (T2DM) is a disease in which insulin is abnormally secreted or does not act correctly; leading to elevated blood glucose (GSPP, 2008). Over time, elevated glucose levels can lead to multiple organ damage. Diabetes is the leading cause of chronic renal failure, adult blindness, and limb amputation, and is a major risk factor for heart disease, stroke, and birth defects (Doria *et al.*, 2008). Diabetes mellitus is a potentially morbid condition with high prevalence worldwide, this has affected millions of people all over the world, thus the disease constitutes a major health concern (Macedo *et al.*, 2002).

Adiponectin is a 30-kDa protein that consists of an N terminal collagenous domain and a C-terminal globular domain (Pajvani *et al.*, 2003); adiponectin was found to be as the most abundant adipokine and count for 0.01 % or 3–30 µg/ml of total plasma protein (Gu, 2009).

Low adiponectin levels are consistently associated with a higher risk of type 2 diabetes (Li *et al.*, 2009). In mice, chronic administration of recombinant adiponectin leads to enhanced fatty acid oxidation, and weight loss (Fruebis *et al.*, 2001) with beneficial effects on lipid metabolism and insulin sensitivity (Yamauchi *et al.*, 2001). Furthermore, adiponectin knock-out mice are highly sensitive to diet induced insulin resistance (Maeda *et al.*, 2002).

Adiponectin acts through its receptors, ADIPOR1 and ADIPOR2. It was initially thought that ADIPOR1 was primarily expressed in skeletal muscle, whereas ADIPOR2 was predominantly expressed in liver (Yamauchi *et al.*, 2003). ADIPOR2 is highly expressed in human muscle and may be the predominant isoform through which adiponectin exerts its insulin-sensitizing effects in

skeletal muscle (Civitarese *et al.*, 2004). Plasma adiponectin levels are influenced by various factors and their relative influence is still a matter of debate (Kacso *et al.*, 2012).

Materials and Methods.

This study includes sixty six diabetic patients (24 males and 42 females), with age range of 40-74 years and twenty five person as controls. The patients were selected from Baquba general hospital. T2DM was defined as excess of glycosylated hemoglobin (HbA1C) ≥6.5 %. Patients with any medical condition or patients suffering from chronic kidney disease were excluded from the study. Control subjects were apparently healthy, non-T2DM individuals free of any medical complications. Control subjects with history of T2DM, HbA1C>5.8 % excluded from this study.

Anthropometric measurements. Anthropometric measurements were done by same person. Height and body weight were measured without shoes. Body mass index (BMI) was calculated as weight/height^2 kg/m^2.

Adiponectin Measurement. The Quantikine Human Total adiponectin Immunoassay is a 4.5 hour solid-phase ELISA which was designed to measure the total (low, middle, and high molecular weight) of human adiponectin in cell culture supernates, serum, and plasma. This kit was supplied by R&D Company.

Results and Discussion

Adiponectin levels were significantly reduced in T2DM patients than in control group with mean and standard error of 8.98 ± 0.86µg/ml vs. 12.51 ± 1.53µg/ml, respectively. Significant differences were found out in adiponectin levels between males and females (5.58 ± 0.64µg/ml vs. 10.95 ± 1.22µg/ml respectively). Not surprisingly; the results shown in **Table (1)** indicate that the T2DM group displayed a significantly reduction in plasma adiponectin concentration as compared with control group. The same result was obtained by a study conducted in Kerbala province: Iraq, by Al-Kayatt *et al.* (2011) and in Japan by Hotta *et al.* (2000).

Table 1. Comparison between patients and healthy group in study parameters

Parameters	Mean ± SE		T-test value
	Patients (No. 66)	Control (healthy) (No. 25)	
BMI (kg/m^2)	28.29 ± 0.58	27.01 ± 0.61	2.024
HbAIC (%)	9.59 ± 0.23	4.58 ± 0.10	0.744
Adiponectin level (µg/ml)	8.98 ± 0.86	12.51 ± 1.53	3.375
(P>0.05), NS: Non-significant.			

BMI : Body Mass Index, HbAIC : glycosylated hemoglobin.

Adiponectin is reduced in the serum of type 2 diabetic and obese patients, and is further decreased in patients with cardiovascular disease. The correlation between adiponectin levels and the risk for type 2 diabetes mellitus was shown in another study (Tataranni and Ortega, 2005). Results of this study revealed that the differences between the adiponectin level and the BMI were not significant. This can be explained by saying that the BMI is not a good indicator for obesity. Adiponectin levels were significantly reduced in T2DM patients male with a mean and standard error of (5.58 ± 0.64 µg/ml) more than that of female (10.95 ± 1.22 µg/ml) (Table 2).

Table 2. Effect of gender of patients group on studied parameters

Parameters	Mean ± SE		T-test value
	Male	Female	
Adiponectin level (µg/ml)	5.58 ± 0.64	10.95 ± 1.22	3.402 *
* (P<0.05)			

Significant differences were found in adiponectin levels between male and female. This result may be due to the fact that men are susceptible to abdominal fat deposition, particularly in the abdominal cavity, a condition described as visceral obesity (Despres *et al*., 2000). The biological regulation of adiponectin is complex and is influenced by a number of factors including age, gender, fat mass and sexual hormones; interestingly, total adiponectin is lower in men than women and does not differ between premenopausal and postmenopausal women, suggesting that androgens may influence adiponectin. Adiponectin is secreted from adipose tissue and typically circulates in an inverse manner to visceral fat mass. A number of endocrine factors, including androgens and estrogens are known to influence adiponectin concentrations. Previous report indicate that testosterone lowers total adiponectin within the circulation (Yarrow *et al*., 2012).

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Marketing Mix Standardization/Adaptation and Export Performance

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Abstract. The standardization versus adaptation of the international marketing strategy (marketing mix) and its relationship with export performance has been a focus of many researchers in last five decades.In existing literature there are many arguments, presented by different authors, favouring standardization, but on the other hand there are also numerous studies that support advantages of marketing mix adaptation. The main purpose of this paper is to develop research propositions for marketing mix standardization/adaptation and its relationship with export performance focusing on firms in Bosnia and Herzegovina.

Keywords: marketing mix; standardization; adaptation; export performance.

Introduction

In order to compete successfully in ever more globalized markets, multinational as well as small and medium size enterprises recognize that a critical condition for long - term growth is international presence. The most important aspect for success in reaching global competitive advantage for firms is to propose additional value for international customers by providing them with benefits that are expressively better than those delivered by the competitors. In practice, firms achieve competitive advantage by using strategies that are suitable to their own situation and providing the different degree of standardization or adoption of the various elements of international marketing strategies (Doole & Lowe, 2012). In this sense the concept of international marketing strategy standardization versus adaptation and its effect on export performance, has been a research area of growingconcern for both academics and practitioners (Rosenbloom, Larsen, & Mehta, 1997; Viswanathan & Dickson, 2007; Waheeduzzaman & Dube, 2004). Kahn(1998) sees this topic asone of the most relevant marketing topics for the twenty-first century.

Even dough many studies have been written about standardization/adaptation of the international marketing strategy and the possibleconnection with export performance, again there is a certain need for further research consideration(Katsikeas, Samiee, & Theodosiou, 2006; Lages, 2000; Shoham, 1999; Theodosiou & Leonidou, 2003; Waheeduzzaman & Dube, 2004; Zou, Andrus, & Norvell, 1997).

Also, many researchers in international marketing field focused on the influence ofthe standardisation/adaptation strategy of a particular marketing mix element on export performance. Most of them considered *product*(Akaah, 1991; Dawar & Parker, 1994; Du Preez, Diamantopoulos, & Schlegelmilch, 1994; Hougan, Hung, & Wardell, 2000; Hult, Keillor, & Hightower, 2000; Jain, 1989; James & Hill, 1994; Johnson & Arunthanes, 1995; Kreutzer, 1988; Littler & Schlieper, 1995; Sands, 1979; Shoham, 1996b; Szymanski, Bharadwaj, & Varadarajan, 1993; Wind, 1986) or *promotion*(Colvin, Heeler, & Thorpe, 1980; Greer & Thompson, 1985; Harris, 1994; James & Hill, 1994; Laroche, Kirpalani, Pons, & Zhou, 2001; Onkvisit & Shaw, 1999; Papavassiliou & Stathakopoulos, 1997; Shoham, 1996b; Whitelock & Rey, 1998) while influence of *price*(Baalbaki & Malhotra, 1995; Bellur, Chaganti, Chaganti, & Singh, 1985; Botschen & Hemetsberger, 1998; Brandt & Hulbert, 1977; Chang, 1995; Jain, 1989; Samli & Jacobs, 1995; Theodosiou & Katsikeas, 2001) and *distribution*(Dow, 2001; Gielens & Dekimpe, 2001; Lages & Montgomery, 2004; Rosenbloom et al., 1997; Shoham, 1999)standardisation/adaptation on export performance received less attention.

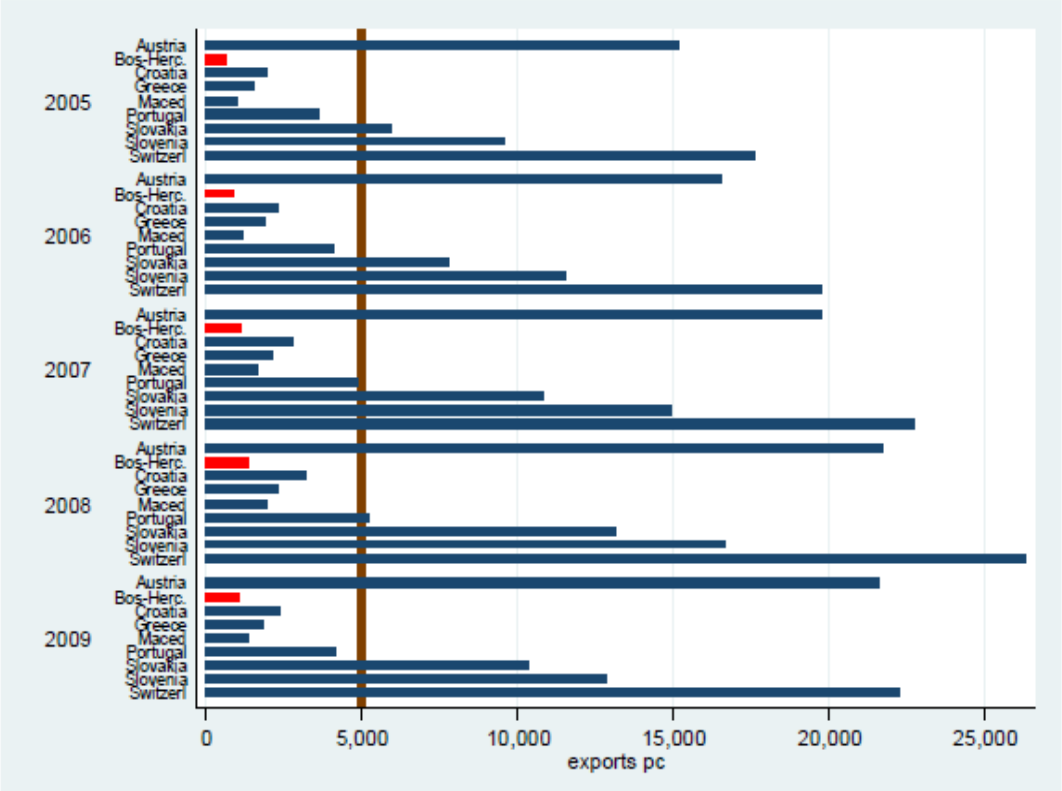
Most of the studies on international marketing have focused either on companies centered in the United States of America (USA) (Calantone, Kim, Schmidt, & Cavusgil, 2006; Theodosiou & Leonidou, 2003; Waheeduzzaman & Dube, 2004) or on the Anglo-Saxon background in overall, as current studies on export performance expose(Lado, Martínez-Ros, & Valenzuela, 2004; Sousa, Martínez-López, & Coelho, 2008; Sousa, 2004). Considering this situation research that will pay special attention to European firms is highly needed. Bosnia and Herzegovina represents one of the European economic locations which got partial research consideration in the export centered literature. Similar to many other European countries Bosnia and Herzegovina has to focus on international trade, particularly the increase inthe volume andvalueof its exports in order to grow the economy, to createjobs andincreaseeconomicwelfare of its citizens,. To say that theexportis requirement forsurvivalmay sounddramatic, butthere can be nodoubtthat our countryneeds to improve itstradingresultin a shortperiod of time (Export Council BiH, 2011).

A key challenge for the BiH economy is weak supply side, or low levels of production, especially for export. Low level of GDP per capita and its growth rate of 5-6% in the period before the global economic crisis were disappointing. The economy suffers of inefficiency, both static (poor distribution of existing resources, especially labor), and dynamic (low capital accumulation of all kinds, primarily infrastructure). This is the reason why the per capita GDP and export value per capita at such low levels.(Export Council BiH, 2011).

Obstacles to economic growth and export growth, and reduce trade deficits are numerous, but they mostly originate from a very small private sector, low competitiveness of the economy, and therefore its low profitability and a small number of investment activities. The result is the very low value of exports and GDP per capita. (Export Council BiH, 2011).

Values of exports per capita are small even compared to the transition countries. They are lower than those in Macedonia for 1.4 times, in Croatia by 2.5 times, the Slovenia by 9.6 times, and in Slovakia to 13.1 times. Value of exports per capita, which are less than $ 5,000 should be seen as a failure (see Figure 1). (Export Council BiH, 2011).

The research focus of this paper is to investigate the relationship of marketing mix (product, price, distribution, communication) standardization/adaptation and export performance of firms in Bosnia and Herzegovina and to provide possible research propositions.Even though there are number of studies exploring the degree of standardization of individual mix elements, in order to increase our understanding of the relative “importance” of each of the marketing mix elements, studies incorporating all the four elements to a single study are needed.



Source: Export Council BiH, Export Growth Strategy 2012 - 2015

Figure 1: Exportsper capitacomparativecountries, 2005-2009

In this study the will relevant literature review on the relationship between the standardization/adaptation of the international marketing mix elements and export performance is highly explored in the following section. Propositions for possible research on marketing mix standardization/adaptation and its relationship with export performance will be proposed as well as conceptual model.As final sections of this paper, conclusions and a review of the implications for academia and practitioners will be presented as well as limitations of the study and directions for future research.

1. Literature Review and Research Propositions

1.1. Historical Trend by Decade

Standardization vs. adaptation of the marketing mix elements has been a topic of research during fifty years that received a lot of interests by researchers and practitioners. First articles that have been discussing the issue of marketing mix standardization/adaptation were published in 1960s. Elinder(1965)argued in his study that advertising have to be harmonized to appropriate the all-European media, and have to take benefit of border-crossing tourists, readers, and viewers. In explaining the advertising standardization he noted that if several national advertising themes are used for the same product it will bring a loss of efficiency. That's why advertising campaigns could be standardized across European countries in the same way they were standardized across states in the USA.

In addition to advertising standardization,Buzzell(1968)protracted the debate to cover also other marketing mix elements. He noted that standardizing various elements of the marketing mix tools used in different areas will gain range from substantial cost savings and more consistent dealings with customers to better planning, control, and exploitation of ideas with universal appeal.Among the articles that were published in 1970s, the one prepared bySorenson & Wiechmann (1975) received most citations.

A few review papers were published in 1980s (Bellur et al., 1985; Boddewyn, Soehl, & Picard, 1986; Walters, 1986). Also, some theoretical models were developed and tested in this period (Jain, 1989; Rau & Preble, 1987). A comprehensive review of the topic in the international marketing field started from 1990s on. In this period many papers have been published (Akaah, 1991; Baalbaki &

Malhotra, 1993, 1995; Cavusgil, Zou, & Naidu, 1993; Cavusgil & Zou, 1994; Samiee & Roth, 1992; Shoham, 1996a, 1996b, 1999).

Waheeduzzaman & Dube, (2004) in their study used content analysis to investigate trends and developments in standardization/adaptation by analyzing 130 articles in 26 journals published in the period 1960 to 2002 year. Most of the papers that were published in these 26 journals were the papers that are published in Journal of Global Marketing, International Marketing Review, Journal of World Business, and Journal of International Marketing (21, 18, 13, and 11 articles).

They also identified five phases of international marketing strategy standardization/adoption research. In *I phase* that belongs to the period from 1961 to 1970, advertising and promotion standardization strategies were mainly investigated, in a sense weather to standardize or adopt. In p*hase II (1971-1980)*, number of empirical studies increased, and these studies had focus at both, promotion and product. Papers published in phase III (1981-1990) continued researching promotion and product by advancing certain theoretical models. Complex theoretical models, comprehensive studies, multiple relationship studies were conducted in *phase IV* (1991-2000), and all 4P's were included. And *phase V (2001-)* was remarked by publications of complex models and comprehensive papers, as result of increase of knowledge in the area (Waheeduzzaman & Dube, 2004).

1.2. International Marketing Strategy Standardization/Adaptation and Export Performance

1.2.1. Product Strategy Standardisation/Adaptation

During the past four decades, the field of international marketing strategies has paid specific attention to the forces that drive adaptation or standardization of particular marketing mix elements. Following this context, numerous studies (Theodosiou & Leonidou, 2003) have concentrated on the reasons that influence the level of product adaptation. (Hultman, Robson, & Katsikeas, 2009). There are many studies that provide positive relationship between adapting products to the local market and export performance (Calantone et al., 2006; Cavusgil & Zou, 1994; Lee & Griffith, 2004; Shoham, 1999), but on the other hand some scholars argued in their studies that standardized products are more successful (Christensen, Da Rocha, & Gertner, 1987; Zou et al., 1997).

In their detail analyses of 36 empirical studies Theodosiou & Leonidou, (2003) found that product element of the marketing mix and product related issues appear to be the most standardized marketing mix element. Beyond this study, Michell, Lynch, & Alabdali, (1998) in their study found that the degree of standardization of product-related variables was greater than the other marketing mix elements by UK firms exporting to the six Gulf States. Similar results we can find also in Quester & Conduit, (1996) study. The study investigated this issue, based on a mail survey of some 200 Australian subsidiaries of MNCs. And findings enabled the researchers to conclude that standardisation is usually consistent across products and services within any one firm.

Studies that were recently published (Doole & Lowe, 2012; Katsikeas et al., 2006; Siraliova & Angelis, 2006; Vrontis, 2003), again support the claim that companies standardize most product element in their marketing mix.

In their study Theodosiou & Leonidou, (2003) provided several potential reasons for the higher degree of standardization of the product element that can offer number of benefits, like: a) the greater motivation to gain the benefits from economies of scale in research and development and production, b) the wish for fastdispersal of new products in the market, particularlyfollowing the fact that product lifecycles are increasingly becoming shorter, and c) the necessity to accomplish better harmonization through the application of more constant internal production controls and quality standards.

Considering mentioned studies that are supporting positive correlation of product standardization with satisfaction of export performance, a following proposition can be proposed:

P1. Standardization of product strategy enhances export performance. The more standardized the product component to export markets, the higher the export performance.

1.2.2. PricingStrategy Standardisation/Adaptation

Even though price standardisation versus adaptation has been neglected in the literature (Lages, 2000), again the results obtained in relationship with export performance are mixed (Shoham, 1996b). Supporting this concept, there are numerous studies that recognise a positive relationship between price strategy adoption and export performance (Das, 1994; Lee & Griffith, 2004; Shoham, 1996b). When we talk about export sales volume than we can find in Leonidou,

Katsikeas, & Samiee, (2002) literature review a strong positive relationship between price adjustment and export performance. Alternatively, there are other studies that indicated negative relationship between price adaptation and export performance (Lages & Montgomery, 2005; Ozsomer, Bodur, & Cavusgil, 1991; Shoham, 1999; Sousa & Bradley, 2008). Studies about price standardization/adaptation have showed diverse results. While Shoham & Albaum, (1994)described in their study that price adaptation enhanced profitability, later on Shoham, (1996b)stated a negative impact.In the same way, it was presented in Koh & Robicheaux, (1988)study that price adaptation enhanced performance, but only when it was higher than domestic prices; it harmed it otherwise.

P2: Price adaptation is positively related to the export performance.

1.2.3. Promotion Strategy Standardization/Adaptation

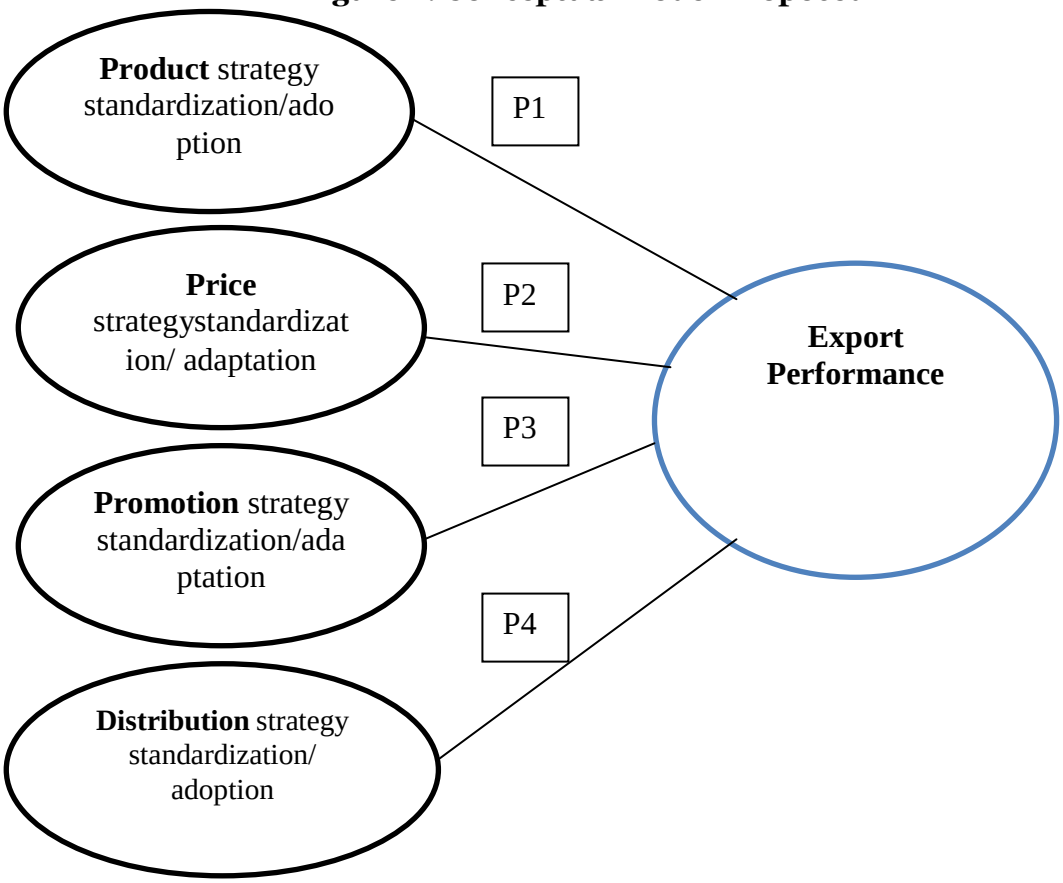
When we talk about promotion standardisation/adaptation we can find many studies reporting that firms that adapt their international promotional strategies faces improvements in export performance(Cavusgil et al., 1993; Poulis & Poulis, 2011; Shoham, 1996b, 1999).

In the same way, in Leonidou et al., (2002) study, findings showed positive association between promotion adaptation and overall performance, but on the other hand Cavusgil & Zou, (1994),stated a negative association between promotion adaptation and export performance, arguing thatcompetitive pressure in the export market leads to promotion adaptation. Still, there are some other studies that did not find any significant relationship between promotion export strategy and export performance(Lages, 2000; O'Cass & Julian, 2003; Samiee & Roth, 1992).

P3: Adaptation of promotion element of marketing mix enhances export performance. The more adapted the promotion component of the marketing mix to export markets, the higher the export performance.

1.2.4. PlaceStrategy Standardization/Adaptation

Figure 2. Conceptual Model Proposed



Compering the international place strategy standardization/adoption with three discussed above we can say that this marketing mix elementreceived particularly little attention in the context of standardisation versus adaptation controversy (Rosenbloom et al., 1997; Shoham, Brencic, Virant, & Ruvio, 2008; Zou & Stan, 1998). Leonidou et al., (2002) stated in their study that the few research which studied distribution standardization/adaptation strategy, mainly explained that the exporting enterprise's channel design should be adjusted in the export markets. In their comprehensive review they reviled a strong positive relationship between distribution adaptation and export performance, mostly when measured as export intensity and export profit level.

Shoham (1996b), in his study supported the positive influence of distribution adaptation on export performance, but the same author reviled a positive significant association between distribution standardisation and static export performance in his study from 1999 (Shoham, 1999). But also some other studies did not recognize any substantial connection between distribution export strategy andensuing export performance (O'Cass & Julian, 2003; Samiee & Roth, 1992)

Rosenbloom et al., (1997) in their study found relationship between distribution strategy and export performance, but they argued that high standardization of export distribution strategy might not bring profit to organization and myght be infeasible. There for, researchers have standard that firms mostly adapt their distribution strategy for export markets(Shoham et al., 2008). Accordingly:

P4: Distribution adaptation enhances satisfaction with export performance. The more adapted the distribution component of the marketing mix to export markets, the higher the export performance.

Implications and Conclusion

Standardization vs. adaptation of the marketing mix elements has been a topic of research during last fifty years that received a lot of interests by researchers and practitioners. The research focus of this paper was to investigate the relationship of marketing mix (product, price, distribution, communication) standardization/adaptation and export performance of firms in Bosnia and Herzegovina and to provide possible research propositions. Combining both theoretical and empirical studies in international marketing, international business, and strategic planning, a model for making the standardization/adaptation decision is proposed.

Marketing mix standardization/adaptation can be reviewed with reference to product, price, promotion, and distribution decisions. Previous research has focused primarily on marketing mixadaptation of price, promotion and distribution element of marketing mix, while the product strategy is proposed to bestandardized.

Considering propositions mentioned in the study following managerial guidelines can be proposed: First, exporting companies in Bosnia and Herzegovina should pursue a high degree of standardization of the product component of the marketing mix. This will improve export performance (e.g., sales and profits). Second, exporting companies in Bosnia and Herzegovina should pursue a high degree of adaptation of the channel, price and promotion component of the marketing mix. This would result in improved objective performance and improved satisfaction with performance.

Limitations and Direction for Future Research

There are several limitations that can be highlighted in the study. First limitation is that the conceptual model proposed in this paper is not formally tested i.e. by mean of questionnaire, surveys, interviews etc. Second limitation is that the study is focused only on marketing mix standardization/ adaptation and its relationship with export performance, but different factors that can influence (Jain, 1989) or moderate (Shoham, 1996b) this relationship are neglected. Third limitation is that our proposed study is focusing on a single country organization, future research should be constructed to consider others country's organization. A broad context such as the one proposed here has been missing. This context is expected to be beneficial in upcoming studies in directing research attention to key variables and relationships.

In order to bring more benefits into the standardization versus adaptation debate, future research would be most efficient when several of mentioned guidelines are combined into a single

design. Once more, research that incorporates determinants discussed in Jain, (1989) should have far-reaching managerial implications. That's why the need for further research on the impact of numerous drivers of the decision to standardize or adapt components of the export marketing mix is highly required (Jain 1989).

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Application of Ann in Australian Credit Card Approval

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Abstract. Nowadays, credit cards became popular in both developed and developing countries. For lenders, more credit card applications mean more complex decision making process. The purpose of this research was to examine how accurate and reliable results Neural Networks (ANN) can provide for Credit Card approval. Research was done using Australian Credit Card Approval Dataset which has interesting mixture of data and 690 instances. Thirty experiments were done using two and three hidden layers, and back-propagation training method. Results indicated high level of reliability and accuracy of 87 % which is good empirical evidence that ANN can be used as reliable tool for credit card approval.

Keywords: Neural networks (ANN), bank, credit card, accuracy.

Introduction

In the era of capitalism, efforts to include disadvantaged in the process of entrepreneurship and to decrease the gap between poor and rich people resulted in demand for loans and credit cards. Because of globalization, even in the developing countries, use of credit cards became reality. This is opportunity for clients, but on the other side, threat for lenders who are faced with more complex problem of credit approval. According to Sum Sakprasat& Mark C. Sinclair (2007), this is particularly true in situations, such as developing countries, where established guidelines and models from developed countries may not be reliably applied. Therefore they stated that there is a need for automatic credit approval that can assist credit professionals in assessing consumer credit applications (Sakprasat&Sinclair, 2007).

Twelve years back, Kate A. Smith &Jatinder N.D. Gupta (2000) stated that neural networks are becoming increasingly popular in business and that many organisations are investing in neural network and data mining solutions to problems which have traditionally fallen under the responsibility of operations research. In fact, over the last two decades, because of complexity that business is being faced with, especially international businesses, and because of rapidly changing environment, managers are trying to find additional tools to make better decisions. Therefore, technologies such are neural networks; data mining methodologies are becoming increasingly popular. They are being used for various tasks, but main are forecasting, modelling, clustering and classification. It is important to say that for many years, banks used credit scoring techniques to determine which loan applicants they should lend money to (Smith& Gupta, 2000).

This paper is trying to find out up to which level of accuracy, Analytical Neural Networks can be used as reliable tool for processing credit card applications and making the right decision.

Literature review

As technological development and its application in banking sector are quite well covered by the literature, it is possible to state that there were no difficulties while searching for adequate references regarding this research. Literature used in this work is mixture of journal articles (mainly), conference proceedings, one book and website.

In 1992, Herbert Jensen wrote an article that presents utilization of ANN in credit scoring using personal DOS computer. Logic of classification customers into groups enables decision maker to make right decision about providing of loan. Main reason for considering this article in literature review is fact that same logic was applied in this research. Difference is only of formal character. While in 1992, personal DOS computer was used to conduct credit scoring, nowadays with powerful personal computers and Mat-Lab; credit scoring can be done much faster and with much more variables involved (Jensen, 1992).

One year later, in 1993, Mohammed H.A. Tafti and EhsanNikbakht were writing about NN as new horizon in business finance applications. In this work, authors explained that NN involve an emerging artificial intelligence (AI) technology which simulates the human brain on the computer. This enablesanalysing problems considering many variables. Main characteristic of NN is ability to learn, similar to human learning process. In next section of his work, Tafti and Nikbakht (1993) mentioned that NN is widely used in making financial decisions, and as one of the examples they mentioned credit scoring. Using NN for credit scoring is actually utilizing a model or method of evaluating a set of variables to determine creditworthiness of the personal or commercial loan applicants. The model takes the value of each variable and calculates a combined credit score (Tafti&Nikbakht, 1993).

Before writing our article, since area of both authors is Management, it was very important to find a resource that will provide basic insights into ANN and its applications in business. Smith & Gupta (2002) wrote book which exactly matched our need, and provided all information necessary to understand the issue of ANN as business tool. After introducing ANN, authors in this book explained its application in all segments of business such are: Retail Sales and Marketing, Modeling Premium Price Sensitivity of Automobile Insurance Customer, Identification of High-Value Customers for a Large Retail Store in Japan, Segmentation of the Portuguese Clients, Target Selection in Direct Marketing, Prediction of Survival and Attrition of Click-and-Mortar Corporations, Corporate Strategy and Wealth Creation, Credit Rating Classification, Credit Scoring Using Supervised and Unsupervised Neural Networks, Predicting Automobile Insurance Losses, Technical Forecasting of Foreign Exchange Rates, Using Neural Networks to Discover Patterns in International Equity Markets, Cash Flow Forecasting. After going through this book, chapter 10 (which deals with credit scoring) was selected as area of our research (Smith & Gupta, 2002).

Motivated with businesses' high level of utilizing and relying upon intelligent solutions such are NN and genetic algorithms (GA), Metaxiotis and Psarras (2004) wrote an article which provides overview for the operations researcher of the neural networks and genetic algorithms methodology, as well as their historical and current use in business. Their aim was actually to present NN and GA's applications in businesses recorded by the literature. In the end, authors concluded that literature provided many empirical evidences that both NN and GA provide practical benefits to organizations (Metaxiotis and Psarras, 2004).

Sum Sakprasat and Mark C. Sinclair (2007) investigated Australian Credit Card Approval data set using eight different genetic programming (GP) approaches for the classification. Overall accuracy level of their results was 83 percent. It is important to state that our research was using the same dataset, and investigating same issue but through application of NN instead of GP. Since result of our research indicated accuracy level of 87 percent, it is possible to conclude that NN till now proved to be more accurate than GP (Sakprasat and Mark C. Sinclair, 2007).

Considering ANN as an inductive algorithm in discovering predictive knowledge structures in financial data and used to explain previous bank failures in the Turkish banking sector, Gunay and Ozkan (2007) aimed to propose a new technique to prevent future crises, with reference to the last banking crises in Turkey. Authors concluded that ANN can be very useful to predict patterns, trends in financial data, and therefore it can be utilized as powerful tool to predict potential failures and signalize possibility of making mistake long time before it happens. This is one more article

that supported statement about high level of practical benefits of ANN application by banks (Gunay&Ozkan, 2007).

Nabil El-Sawalhi, David Eaton and RifatRustom (2008) wrote paper with purpose to introduce an evolved hybrid genetic algorithm and neural network (GNN) model. Authors developed model to predict contractor performance given the current attributes in a process to pre-qualify the most appropriate contractor. In the end, results indicated that there is a satisfactory relationship between the contractor attributes and the corresponding performance in terms of contractor's deviation from the client objectives. Model accuracy was 85 percent (El-Sawalhi, Eaton, Rustom, 2008).

Abdou (2009) investigated efficiency and effectiveness of alternative credit-scoring models for consumer loans in the banking sector through testing data set of 630 loan applications. Investigation was conducted into both neural nets (NNs), such as probabilistic and multi-layer feed-forward neural nets, and conventional techniques, such as the weight of evidence measure, discriminant analysis and logistic regression. NNs gave better average correct classification rates (Abdou, 2009).

Marina Dobrota, NemanjaMilenković, VeljkoJeremić, AleksandarĐoković (n.d.) used NN to classify countries according to the level of economic development, in terms of measuring income in these countries. Results indicated that the classification accuracy is over 87%, and that GDP per capita, food supply and GDP per employee are factors proven to be the main indicators of the level of countries' economic development in terms of measuring income in these countries (Dobrota, Milenković, Jeremić, Đoković, n.d.).

Literature review is summarized in Table 1 presented below.

Table 1. Summary of Literature Review

Authors	Year	Title	Literature review
Herbert L. Jensen	1992	Using Neural Networks for Credit Scoring	Utilizazion of ANN in credit scoring using personal DOS computer in far 1992.
Mohammed H.A. Tafti and Ehsan Nikbakht	1993	Neural Networks and Expert Systems: New Horizons in Business Finance Applications	Neural Networks (NN) was percieved as new horizont in business finance applications.
Kate A. Smith, Jatinder N. D. Gupta	2002	Neural Networks in Business: Techniques and Applications	After introducing ANN, authors in this book explained its application in all segments of business.
Kostas Metaxiotis, John Psarras	2004	The contribution of neural networks and genetic algorithms to business decision support	Authors concluded that literature provided many empirical evidences that both NN and GA provide practical benefits to organizations.
Sum Sakprasat, Mark C. Sinclair	2007	Classification Rule Mining for Automatic Credit Approval using Genetic Programming	Authors investigated Australian Credit Card Approval data set using eight different genetic programming (GP) approaches for the classification. It is same dataset used in our research. Since result of our research indicated accuracy level of 87 percent, it is possible to conclude that NN till now proved to be more accurate than GP which was 83 percent.

E. NurOzkan-Gunay and Mehmed Ozkan	2007	Prediction of bank failures in emerging financial markets: an ANN approach	Authors concluded that ANN can be very useful to predict patterns, trends in financial data, and therefore it can be utilized as powerful tool to predict potential failures and signalize possibility of making mistake long time before it happens.
Nabil El-Sawalhi, David Eaton, Rifat Rustom	2008	Forecasting contractor performance using a neural network and genetic algorithm in a pre-qualification model	Results indicated that there is a satisfactory relationship between the contractor attributes and the corresponding performance in terms of contractor's deviation from the client objectives. Model accuracy was 85 percent.
Hussein A. Abdou	2009	An evaluation of alternative scoring models in private banking	After many evaluations of various alternatives, NNs gave better average correct classification rates.
Marina Dobrota, Nemanja Milenković, Veljko Jeremić, Aleksandar Đoković	n.d.	Neural Networks in determining the level of countries' economic development	Results indicated that the classification accuracy is over 87%, and that GDP per capita, food supply and GDP per employee are factors proven to be the main indicators of the level of countries' economic development in terms of measuring income in these countries.

Problem definition

In order to explain the problem, it is important to define two important terms, credit risk and credit scoring. According to Kah Hwa Ng (1996), credit risk is defined as risk of loss to lenders due to customers defaulting on their credit obligations because of unwillingness, inability, bankruptcy or any number of other reasons why the customers cannot repay the credit. Liu, (2001) says that credit scoring refers to evaluation system created to improve lender's abilities in determining the credit risk of client in process of risk analysis.

In most cases, empirical testing of credit risk is based on analysing past client's credit data using appropriate algorithms. This is powerful step to know more about client and his ability to handle the credit. In order to see how Artificial Neural Networks can contribute to solving mentioned problem, it was decided to use Mat-lab to test dataset named Australian credit card approval. The main question to answer is actually how to select appropriate clients for approving credit cards with minimum possible error.

Australian credit card approval, Data set

Australian credit card approval is dataset consisted of data about credit card applications. All attribute information is changed to meaningless symbols in order to protect privacy of customers and confidentiality of data. Also, dataset is consisted of attributes that are continuous, nominal with small number of values, and nominal with large number of values. Original source of dataset is highly protected, and it is submitted by quinlan@cs.su.oz.au. Dataset has fourteen attributes, six of which are continuous and eight categorical.

A1: 0,1 CATEGORICAL a,b
A2: continuous.
A3: continuous.
A4: 1,2,3 CATEGORICAL p,g,gg
A5: 1, 2,3,4,5, 6,7,8,9,10,11,12,13,14 CATEGORICAL ff,d,i,k,j,aa,m,c,w, e, q, r,cc, x
A6: 1, 2,3, 4,5,6,7,8,9 CATEGORICAL ff,dd,j,bb,v,n,o,h,z
A7: continuous.
A8: 1, 0 CATEGORICAL t, f.
A9: 1, 0 CATEGORICAL t, f.

A10: continuous.
A11: 1, 0 CATEGORICAL t, f.
A12: 1, 2, 3 CATEGORICAL s, g, p
A13: continuous.
A14: Class - Class 0 - Class 1 continuous

Number of instances in this data set is 690. Also, it is important to ad that in the dataset, there were missing values in 37 cases which is 5 %. There were one or more missing values in those cases. Those missing values were:

A1: 12
A2: 12
A4: 6
A5: 6
A6: 9
A7: 9
A14: 13

These cases were replaced by the mode of the attribute when it comes to categorical dataand by the mean of the attribute in a case of continuous data.

Methodology

Mat-lab 7.12.0.has been usedfor conducting all experiments.In order to find out how accurate results lenders can get using Neural Networks in their decision making about credit approval, back-propagation method of training artificial neural networks was utilized(Figure 1).Through back propagating the errors, network learns from many inputs that come from desired output.

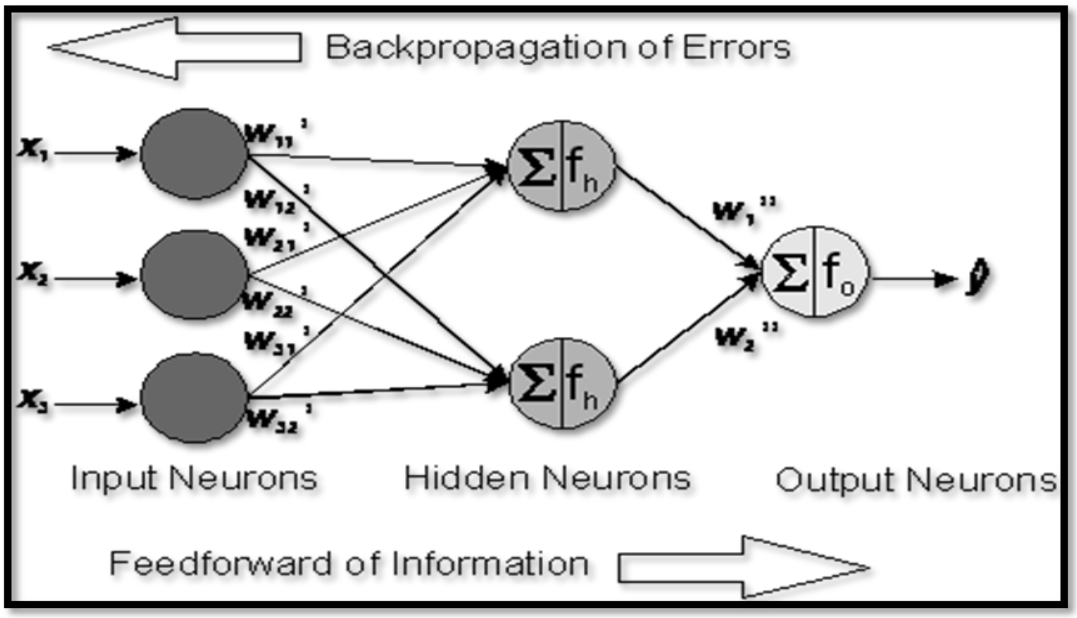

Figure 1. Feed-forward back-propagation network architecture

Architecture of neural network is based on MLP (Multi-Layer Perceptron) network. In order to get most accurate results, in this study it is conducted 30 experiments. Twenty five of them were conducted using architecture consisted of two hidden layers, while five is done using three hidden layers.Also, twenty is done using “trainlm” algorithm of learning, while ten is conducted using “traingd” algorithm of learning. Value of “Epoch” was changing many times accordingly.

When experimenting with two hidden layers, I used “logsig”, “tansig” for first and second hidden layer, and “purelin” function for output layer. During experiments with three hidden layers, “logsig”, “tansig” and “tansig” were functions used for three hidden layers, while “purelin” function was used for output layer (Figure 2).

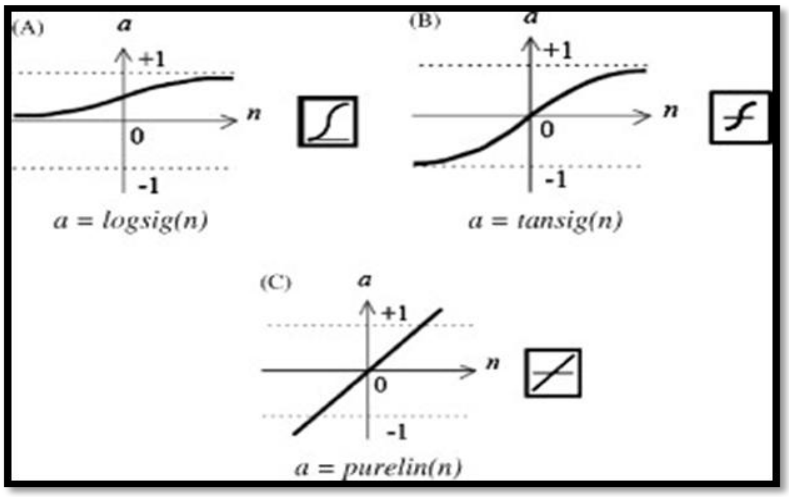

Figure 2. Activation functions used in experiments

Experiments and results

As it was previously mentioned, experiments were done using two and three hidden layers in the neural network architecture, and by using "trainlm" and "traingd" learning algorithms. Experiments and their results will be presented in two tables (Table 2 & Table 3) below. Table 2 presents experiments conducted using three hidden layers architecture of network.

Table 2. Experiments & results using three hidden layers

#	I hidden layer	II hidden layer	III hidden layer	Output layer	Trans Func.	Learning algoryth m	Epoch	Tim e	Accurac y %
1	30	10	5	1	Logsig-tansig-tansig-purelin	trainlm	450	4	83
2	40	30	10	1	Logsig-tansig-tansig-purelin	trainlm	250	21	85
3	37	25	15	1	Logsig-tansig-tansig-purelin	trainlm	500	15	83
4	57	30	20	1	Logsig-tansig-tansig-purelin	trainlm	300	82	80
5	50	40	30	1	Logsig-tansig-tansig-purelin	trainlm	500	135	85

Totally, five experiments have been done using three hidden layers, and from table 2 it is possible to conclude that accuracy levels achieved using "trainlm" learning algorithm and "logsig" "tansig" "tansig" "purelin" as trans. functions are not extraordinary since highest accuracy level was not more than 85 %. Nevertheless, results show level of accuracy that can be reliable tool for lender to use when deciding about credit approval.

Table 3. Results of experiments done using two hidden layers

#	I hidden layer	II hidden layer	Output layer	Trans Func.	Learning algorythm	Epoch	Time	Accuracy %
1	20	15	1	Logsig-tansig-Purelin	trainlm	336	3	84
2	20	10	1	Logsig-tansig-Purelin	trainlm	570	3	82
3	30	10	1	Logsig-tansig-Purelin	trainlm	634	10	87
4	57	20	1	Logsig-tansig-Purelin	trainlm	767	15	84
5	120	30	1	Logsig-tansig-Purelin	trainlm	500	226	77
6	10	5	1	Logsig-tansig-Purelin	trainlm	336	10	87
7	20	10	1	Logsig-tansig-Purelin	trainlm	400	2	79
8	30	10	1	Logsig-tansig-Purelin	trainlm	300	7	80
9	57	30	1	Logsig-tansig-Purelin	trainlm	767	40	75
10	67	37	1	Logsig-tansig-Purelin	trainlm	500	62	83
11	20	10	1	Logsig-tansig-Purelin	trainlm	500	15	85
12	10	5	1	Logsig-tansig-Purelin	trainlm	300	4	78
13	30	20	1	Logsig-tansig-Purelin	trainlm	700	7	83
14	57	30	1	Logsig-tansig-Purelin	trainlm	500	29	83
15	70	57	1	Logsig-tansig-Purelin	trainlm	350	165	80
16	20	10	1	Logsig-tansig-Purelin	traingd	500	7	85
17	10	5	1	Logsig-tansig-Purelin	traingd	570	24	84
18	30	20	1	Logsig-tansig-Purelin	traingd	634	6	82
19	57	30	1	Logsig-tansig-Purelin	traingd	767	15	84
20	70	57	1	Logsig-tansig-Purelin	traingd	500	13	79
21	10	5	1	Logsig-tansig-Purelin	traingd	336	7	66
22	20	10	1	Logsig-tansig-Purelin	traingd	400	5	83
23	30	10	1	Logsig-tansig-Purelin	traingd	300	4	85
24	55	25	1	Logsig-tansig-Purelin	traingd	333	6	85
25	100	40	1	Logsig-tansig-Purelin	traingd	500	13	86

Level of variance among results is not high. Accuracy levels calculated using two hidden layers are values between 75 % and 87 % which means that most of the results are quite reliable. However, the biggest level of accuracy occurred in third experiment. Accuracy level that is achieved using 30 neurons in first and 10 neurons in second hidden layer proved as best result since it achieved maximum accuracy value of 87 %. Mean Squared Error in this case was 0,1305.This supports statement that Artificial Neural Networks can be used as highly accurate and reliable tool for lenders' decision making process. Additionally, mentioned highest result was achieved using "logsig" "tansig" "purelin" activation functions, "trainlm" learning algorithm and the best training performance occurred at634th epoch. Mat-lab did calculation in not more than ten seconds of time (Figure 3).

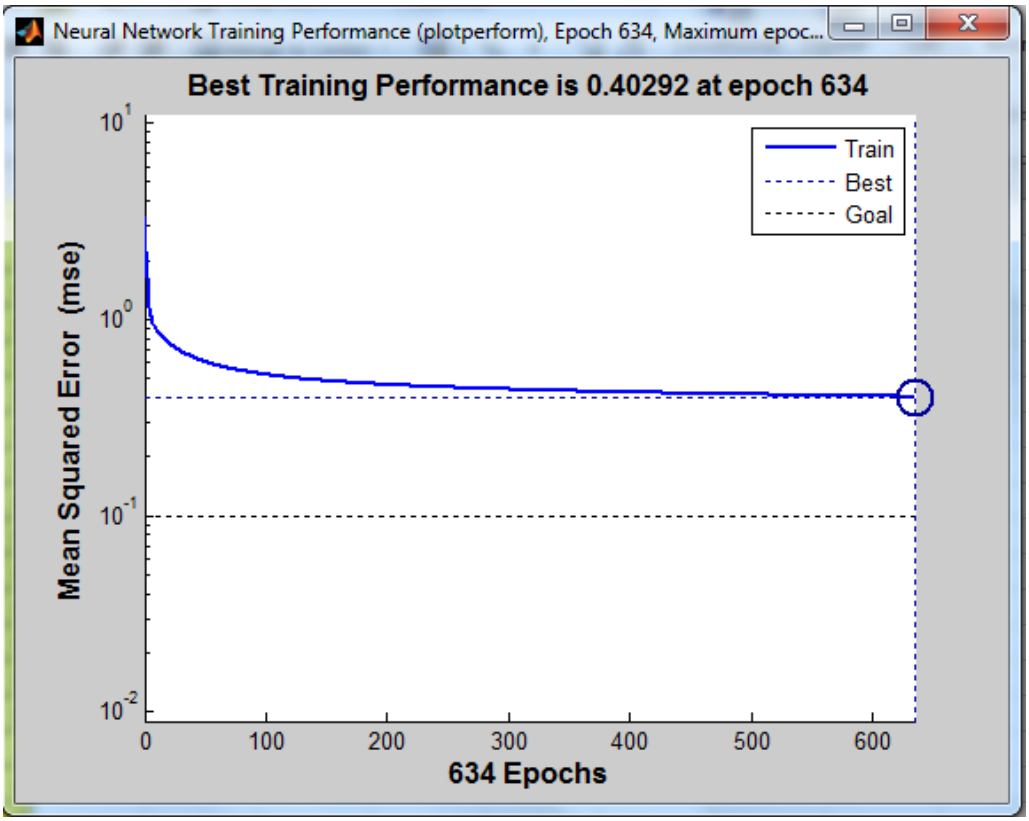

Figure 3. Plot of Best Training Performance

Comparison with other approaches

Overall aim of this research was to find out accuracy level of Neural Networks application in Australian Credit Card Approval. Comparison of this paper's results with results that are achieved through experiments on the same data set but using other approaches shows that results achieved in this study are highly successful and confidential. Results of this study were actually compared with the quality of the best algorithms from Statlog (Statlog datasets: comparison of results) and found that result achieved in this paper are better compared to best results found at Statlog. Best result of minimum error at Statlog is 0, 1310 and minimum error mentioned below in this study is 0, 1305.This comparison makes this study more valuable and proves that Neural Networks should definitely be considered as important tool for automatic credit scoring.

Research limitations

Since in the output layer there was only one neuron which means that result is categorical to 1 or 0 ("yes" or "no"), analysis conducted by Mat-lab in this paper can provide only two groups of clients (credit card applicants). "Yes" refers to group of people whose credit risk is small enough to get credit approval, and "no" reflects applicants with high credit risk so they cannot get credit approval.However, in reality there are always groups of applicants that require deeper analysis because they are somewhere in the middle between mentioned groups. Therefore, they require special attention, and one of the limitations of this research is fact that it gives only "good" and "bad" credit applicants. If research could be conducted in a ways that beside "good" and "bad"

applicants, system offers also "intermediate" ones, it would be more useful since credit lenders would be able to know who among applicants require more attention when deciding.

Conclusion

Nowadays, credit cards became popular not only in developed, but even in developing countries. On the other side, credit lenders are faced with more and more credit applications. This study aimed to learn how accurate result, ANN can provide for Credit Card approval. Research was done using Australian Credit Card Approval Dataset that is big enough and full of data types which is making it more interesting. Experiments were done using two and three hidden layers, and using back-propagation training method supported by using "trainlm" and "traingd" learning algorithms. Best result occurred in an experiment with twenty neurons in first, and ten neurons in second hidden layer at 634th epoch, and its accuracy was 87 %. Compared to results of other approaches, this is very valuable and good accuracy that proves that ANN can be used as reliable tool for credit card approval.

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Педагогические науки

Lifestyle, Physical and Sports Education and Health Benefits of Physical Activity

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Abstract. We present the words and opinions concerning health benefits of physical activity that are largely discussed worldwide but less in Slovakia. Our goal is to spread the knowledge of health benefits of physical activities in pupils' lifestyle and their impact on the development of a new concept of physical and sports education in Slovak schools.

The theoretical knowledge is a part of the grant called: VEGA č. 1/0376/14 Intervention Physical Activities Aimed at Disease Prevention of the Population in Slovakia.

Keywords: benefits; physical education; physical activity.

Introduction. Health is a state of complete physical, mental and social well-being and comfort. What is more, it is the condition of the body that provides its optimum self-regulation as well as the balance between its functions and the environment (human homeostasis). Recently, this word has been widely discussed. Health is genetically determined and it is also affected by the environment, lifestyle and the health care system quality. According to the World Health Organization (WHO, 2010), human health depends on ecological conditions (21 %), genetics (21 %), the health care system quality (8 %) and the lifestyle (50 %). Dobrý (2012) adds that human health is also characterized by positive and negative extremes.

That is why it is necessary to point out the contemporary lifestyle, characterized by the prevalence of so-called "lifestyle" diseases that are comprised in a common term *"chronic non-infectious diseases"*. According to Urvayová (2000), Hendl, Dobrý et al. (2011), the sources of these diseases can be found in the environment made by people or they can be caused by their lifestyle (neurosis, stomach ulcer diseases, ischemic heart diseases, metabolic diseases, diabetes, obesity, allergies, dorsalgia and degenerative diseases of the musculoskeletal system) (Kostencka, 2007). All these diseases are connected with hypokinesis and they have a far-reaching impact on human health.

Physical activity is a tool for maintaining physical and mental balance that can result in increased fitness, performance, self-confidence and self-fulfillment and self-confirmation. Despite its physical and mental benefits, we must say that there is a constant decrease in amount of regular daily or weekly physical activity in all age stages (Liba, 2000).

According to specialists (Teplý, 1995; Šimonek, 2011), optimum amount of weekly physical activity (exercise, sports and motoric reactions) can be determined while objective and subjective determinants (table 1) are taken into consideration.

This situation can be resolved by understanding the significance of physical activity and its health benefits by monitoring and subsequent intervention in the early and school age.

Table 1. Recommended capacity and intensity of sports activities in terms of children's health (Šimonek, 2011)

Authors (year)	Country	Recommended amount of physical activity
Ross and Gilbert (1985)	USA	At least 3 times a week for 20 min. at the level of 60 % aerobic capacity, involvement of big muscle groups.
Stephard (1986)	Canada	At least 3 hours a week, 25 min. t level 4 MET on average.
Pyke (1987)	Australia	Frequency 3–4 times a week, at least 30 min., higher load intensity.
Blair et al. (1989)	USA	Minimum energy expenditure during exercise 3 kcal.kg-1.day-1.
ACSM (1991)	USA	Frequency 3 times a week,, 20 min., minimum intensity or the level 60 % VO2max.
Hatano (1993)	USA	At least 10,000 steps a day (300 – 400 kcal.kg-1d ay-1) as a universal standard for a broad population.
Telama et al. (1994)	Finland	At least 30 minutes of physical activity (PA) a day.
Corbin et al. (1994)	USA	Minimum standard: daily/30 minutes of PA of medium intensity, producing at least 3-4 kcal.kg-1.day -1.
Sallis and Patric (1994)	USA	Recommendations for children and young people aged from 11 to 21 years: 30 – 60 min of PA/daily or almost daily, complemented by 20 min. of PA of high and medium intensity 3 or more times a week.
Bunc (1996)	the Czech Republic	Minimum weekly energy expenditure while doing PA – 6 to 8 MJ, developing into about 17 MJ/a week.
Pangrazi et al. (1996)	USA	Daily 30-60 minutes of medium intensity PA, high-intensity PA are not directly recommended.
Frömel et al. (1999)	the Czech Republic	Everyday minimum intensity: 30 min. of aerobic exercises: PF= 60 – 85 % from max.
Cooper (1999)	USA	Daily 30 – 60 min of PA, including min. 30 minutes of aerobic activities of high and medium intensity 3 to 4 times a week, stretching exercises 3 times a week and strengthening exercises 2 to 3 times a week.
Frömel et al. (1999)	the Czech Republic	Most days of the week: 11 kcal.kg. a day with boys, 9 kcal.kg a day with girls. Average number of steps: 13,000 with boys, 11,000 steps with girls, daily PA more than 95 min with boys and 85 minutes with girls. Proportion of PA in a weekly energy expenditure should be 25 %.
PCPFS (2001)	USA	To make at least 11,000 steps a day, 5 times a week.
President´s Council on Physical Fitness and Sports (2001)	USA	To maintain their health, children are recommended to make 11,000 steps a day, at least 5 days a week.

Strong et al. (2005)	USA	During the day at least 60 minutes of adequate, amusing and various physical activities of medium and higher intensity, with one interval lasting at least 10 minutes.

Recommended amount of physical activity in a daily routine:
4-6 years 25,0 %
7-11 years 20,8 %
12-14 years 16,6 %
15-18 years 12,5 %
Recommended amount of physical activity children should do daily:
4-6 years 6 hours
7-11 years 5 hours
12-14 years 4 hours
15-18 years 3 hours
Source: (http://www.zdrava5.sk/zdravy-zivotny-styl/pohybom-ku-zdraviu)

The benefit or well-being are obtained by an individual as a result of a certain programme's effect (physical activities).

According to Hendl, Dobrý et al. (2011), health benefits of physical activity are demonstrable and obvious in all age categories, regardless of sex:

- increase in high-density lipoprotein,
- high blood pressure decrease (hypertension),
- burning of calories,
- maintaining the blood glucose level,
- increase in bone density,
- boosting of immune system,
- improvement of metabolism,
- increase in efficiency of the body energy systems,
- maintaining the body weight,
- falling asleep faster, better sleep,
- body image enhancement.

The US Department of Health and Human Services (2008) divides physical activities according to their goal into basal, health enhancing and sports activities Hendl, Dobrý et al. (2011).

Basal (basic) physical activity is a new term that replaces the term "common physical activity of everyday life" that has been used so far. It includes activities such as walking, standing, handling objects, which means the activities performed mostly with low intensity.

Health enhancing physical activity is every basal activity and structured physical activity that brings about health benefits under certain circumstances (regularity, intensity, frequency). The term physical activity is often simplified and used in terms of the health enhancing physical activity (Stackeová, 2009).

Sports activities make up a complex of specific physical activities (for more details see Stackeová, 2009, Čechovská, Dobrý, 2010) aimed at improving physical fitness and enhancing physical performance.

Nowadays, the perception of physical activities is different. According to Dobrý (2008a), they used to be seen as activities aimed at enhancing physical fitness, understanding physical activity that reduces the risk of diseases, brings about health benefits and enhances physical fitness.

Physical activity comprises basal, health enhancing and sports physical activities done within a certain time unit (school lessons, time spent outside the school, with the family, a day, a month, an hour, breaks at school, etc.). Physical activities and exercise done regularly within the recommended amount can be defined as permanent physical activities that are regarded as one of the most significant factors of human health at any age (Čechovská, Dobrý, 2010). By contrast, physical inactivity is the opposite of physical activity. It is included in every man's behaviour and it is characterized by a very small amount of basal physical activity and the absence of structured physical activities (Stackeová, 2009). What is more, the consequences of physical inactivity may be connected with certain diseases we have mentioned in the introduction (Dobrý 2008ab).

Physical activity and health benefits are the key to pupils' health.

Physical and sports education presents the educational environment the core of which is an educational process which contains physical activities and is based on integration of intentional teaching and adequate stimulation of the energy system. The main purpose of physical and sports education is to influence pupils' internal motivation and attitudes towards physical activities as well as to encourage them to be physically active throughout their lives. Physical and sports education teachers' primary role is to develop positive environment that can affect pupils' perception of physical activity. That is why physical and sports education should be regarded as an educational institution (environment) with the content consisting of physical activities. It is the only school subject that may have a direct impact on pupils' health, affecting their lifestyle even in adulthood. It is the key factor of enhancing pupils' and teenagers' physical activity and it plays an important role in primary disease prevention. Furthermore, understanding of health-oriented fitness is also of the utmost importance (Bendíková, 2009b).

Health-oriented fitness is defined as fitness that affects one's health condition and prevents health problems related to hypokinesis (Svatoň, Tupý, 1997).Mužík, Krejčí (1997) consider health-oriented fitness as an individual level that is necessary for healthy and active lifestyle.

The level of health-oriented fitness is determined by three basic groups of factors (Bunc, 1996; Svatoň, Tupý, 1997):

1. *Structural* – body composition, weight, height,
2. *Functional*

a) cardio-respiratory fitness (aerobic fitness),
b) muscle fitness,
c) flexibility (muscle and joints mobility),

3. *Body posture in basic positions, the quality of basic movement stereotypes.*

Physical fitness is a result of long-term gradual adaptation to load. This process continues according to physiological laws.

*According to the American College of Sports Medicine, smaller amount and lower intensity of endurance activities that affect the large muscle groups are recommended for health maintenance. Continual aerobic activities lasting 20 to 60 minutes with intensity of 35 to 50 % VO2max, that are done 3 to 5 times a week, should be sufficient.

This means that physical and sports education focuses less on performance oriented teaching and more on health-oriented lessons aimed at shaping pupils' attitudes and values. The content of this subject is more related to health care and focused on exercise as disease prevention and development of a healthy lifestyle. Active health, which is not just the absence of disease but also an attempt people make to improve it by taking preventive measures, is becoming more and more important. Active health can be achieved also by sensible diet, healthy lifestyle and regular physical activity people do throughout their lifetime (Meško, Komadel et al. 2005).

Nowadays, the concept of pupils' health is based on individualization of young people's development and well-being that both depend on their active life and positive self-assessment. Moreover, health should enable pupils to be engaged in activities that enhance their fitness and spark their interest in exercise (Antala, Labudová, 2008). This should lead to the prevalence of diversified innovative content of physical and sports education lessons (Bendíková, 2009a; Dobay, 2011). As a result, making contemporary educational process more effective requires usage of the past experience, anticipation of future trends and development towards pedagogical innovations.

Main advantages of contemporary physical and sports education (Mužík, 2012):

- health maintenance,
- physical activity enhancement,
- shaping pupil's personality,
- content diversification,
- larger amount,
- better teachers,
- continual education.

Main disadvantages of contemporary physical and sports education (Mužík, 2012):

- insufficient amount of physical and sports education,
- shortcomings in the subject's content,

- insufficient quality of teachers,
- inappropriate pupils' attitude toward physical and sports education,
- inadequate equipment and insufficient material supplies,
- financial costs,
- lack of the government's and the society's interest.

All the disadvantages reflect the current situation. They should encourage experts and teachers to seek the ways hot to improve educational process and its output. As far as the school population (and disabled people) are concerned, it is necessary to search for innovative trends (motives for health relaxation, mental well-being and entertainment) to prevent school children and the disabled from losing their interest in sports and exercise due to insufficient diversity and creativity of the physical and sports education content. The number of pupils who avoid exercise is increasing. This may be caused by the fact that compulsory as well as optional physical and sports education is becoming less and less attractive.

We should not forget to mention physical literacy that encompasses basic physical skills, motivation and understanding of how to maintain physical activity at an appropriate individual level throughout one's life Čechovská, Dobrý (2010). Consequently, physical literacy (exercise, knowledge) becomes a clearly specified goal for physical and sports education at school and the significance of physical activities, which bring about health benefits, memorable experiences and continual lifetime physical activity, is becoming more obvious and accepted (Bartík, 2012). Development of physical literacy is becoming the main reason for existence of physical education at school. According to Čechovská, Dobrý (2010), it is implemented in six stages and it can help talented pupils, pupils with health impairment as well as healthy population.

Therefore, physical and sports education teachers should encourage pupils to increase the amount of their regular physical activity and continue including physical activities into their lifestyle. This means teaching pupils to do physical activities of various intensity for about 30 to 60 minutes a day. Furthermore, the teachers should warn pupils of the risks related to physical inactivity, which means changing the way children and teenagers perceive and comprehend the significance of physical and sports education. Hendl, Dobrý et al. (2011) claim that it is necessary to develop and implement intervention programmes focused on increasing the amount of physical activity. One of the effective intervention strategies is the physical and sports education lessons having both organized and non-organized structures. Šimonek (2011) states that it is also important that teachers focus on motivation and interests that could present a kind of stimulation for physical and sports education at schools. Whether this subject is popular or not depends on pupils' success as well as teachers' abilities to spark their interest in it. Bendíková (2009a) adds that popularity of certain physical activities may be increased substantially by non-traditional teaching methods. The school reform implemented in Slovakia in 2008tried to follow such methods by introducing open teaching of physical and sports education that was focused on changes in the subject content:

- from traditional – to non-traditional,
- from boring – to more interesting, bringing more experiences and health benefits.

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Образ жизни, физическое и спортивное обучение и польза для здоровья

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Аннотация. Цель работы заключается в распространении знаний о пользе физической активности для здоровья учащихся и ее влиянии на развитие новой концепции физического и спортивного воспитания в словацких школах. Указанные теоретические познания являются составной частью гранта: ВЕГА № 1/0376/14 Двигательная деятельность как профилактика здоровья для населения Словакии.

Ключевые слова: бенефиты; физическое воспитание; двигательная деятельность.

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Hermeneutic Analysis of Soviet Feature Films of 1941-1942 on the Military Theme

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Abstract. In the article the author performs a hermeneutic analysis of the cultural context (i.e. investigation of media texts interpretation, cultural and historical factors influencing the views of the agency / author of a media text and the audience) of Soviet feature military films of 1941-1942. The author bears in mind that the hermeneutic analysis of a media text comprehension involves a comparison with a historical, cultural tradition and reality; insight into its logic; comparison of media images in historical and cultural contexts combined with the historical, hermeneutical analyses of the structural, plot, ethical, ideological and iconographic / visual analyses of media stereotypes and media text characters.

Keywords: media text; analysis; media culture; media education; media competence; Soviet movies of 1941-1942 about the war.

Introduction. In our earlier works [Fedorov, 2008; 2011; 2012, etc.] we referred to the ***hermeneutic analysis of media texts*** many times [Eko, 1998; 2005; Eco, 1976; Silverblatt, 2001, pp.80-81]. This time we shall take media texts of Soviet feature films on the military theme made after the German aggression against the USSR in the second half of 1941 - 1942s as an example. The analysis of these media texts, in our opinion, is especially important for media education of future historians, culture experts, art critics, social scientists, philologists, psychologists and teachers.

Technology of the media text hermeneutic analysis of soviet feature films of 1941-1942 on the military theme Setting; historical, cultural, political and ideological contexts

A. Historical Context

What does the media text tell us about the time when it was created?

a) setting: June, 1941 - December, 1942; USSR, other countries.

b) when did the premier take place?

The analyzed films were created during the most difficult period for the USSR when the country was at war with Germany (the second half of 1942 and 1942), in the same years they were shown.

c) how did the events of that time affect the media texts?

The real historical events which took place during the pre-war period destroyed the virtual stereotypes of "wars with small losses and in the enemy's territory" which dominated in "defensive" films of the second half of the 1930s (*If Tomorrow Brings War, The Motherland Calls, Tankmen* and others). None of the Soviet films shot during the two years after 22 June 1941 showed the war in the enemy's territory (except for bombings of German cities and guerrilla warfare). Moreover, contrary to the stereotypes of military-utopian films of the second half of the 1930s Lubov Orlova's heroine says in *War Collection of Films №4* (1941) that "we know that the victory will be hard".

d) what events occurred when the media texts were being created? How did the media texts comment on the events? How does the awareness of the historical background contribute to the comprehension of the media texts?

Not only Germany (that had conquered the greater part of Europe by then) and the USSR were involved in the world war of 1941-1942 but also Great Britain, Japan, Italy, Hungary, Romania, Slovakia and the USA. At the same time, Soviet audiovisual media texts of 1941-1942, contrary to the hardest realities of the war (millions of killed, wounded and captured Soviet citizens, Nazi occupation of vast territories of the USSR, etc.), commented (especially in *War Collection of Films №1-5, 1941*) on the current events in the most positive tone.

Evacuation and intensive development of the Soviet armaments industry, military re-equipment of many plants at the cost of incredible toil of manpower resources and defense of front-line towns were extremely important for the period of 1941-1942. This historical context found reflection in films of that epoch (*To You, Front; The Unconquerable*).

B. Ideological, Political Contexts.

How do media texts reflect, strengthen, instill or form this or that ideology?

With the dominating communist ideology and allusions to fidelity to Stalin and the party (*War Collection of Films №1: We'll Knock the Enemy Soon, Be Sure! The Party and Stalin Call Us to Protect Our Motherland! For the Motherland! For Stalin!*) one can detect an adaptation of the communist ideology to patriotic slogans, an ideological orientation towards historical examples of military valor (Alexander Nevsky, Suvorov, Chapaev), and, on the other hand, a reminder of defeated foreign conquerors in Soviet films of 1941-1942. For example, in *War Collection of Films №1* caricatured Hitler is warned about the inevitable defeat from the Russian army by a German knight who got out of Lake Chudskoe, Napoleon and a keiser general of 1918; and in *War Collection of Films №2* Buonaparte sends a telegram to Hitler that runs: "Not advised. I tried and failed".

But the main thing is that one can easily become aware of the anti-Nazi message aimed to convince the audience that:

- Germans resort to mass terrorism against the civilian population and seek to enslave Russians and the Slavs (a short story "100 for One" from *War Collection of Films №2,* some stories from *War Collection of Films №12,* etc.);
- retaliatory terrorism against the German invaders is justified and required for the victory in the war (a short story "A Meeting" from *War Collection of Films №2,* a short story "A Feast in Zhirmunka" from *War Collection of Films №6* in which an elderly woman poisoned the German occupants, a war collection of films "Young Partisans", a short story "At the Old Nurse's" from *War Collection of Films №2,* a short story "The Lighthouse" from *War Collection of Films №9,* a short story "Vanka" from *War Collection of Films №9*);
- one ought to be on the alert as Nazi agents and saboteurs may operate alongside and they must be exposed and annihilated ("The Secretary of the District Committee ", a short story "At the Old Nurse's" from *War Collection of Films №2, War Collection of Films №4,* a short story "One Night" in *War Collection of Films "Our Girls"*);
- USSR is not alone in its struggle against Nazi Germany. This statement is very obviously reflected in *War Collection of Films №4* when the reanimated character of the film "Volga-Volga" - postwoman Dunya gives the following inflammatory speech which was quite impossible to imagine before June 22, 1941: "The leading powerful nations of the world - America and England are with us! The mighty British fleet is fighting against Hitler with us!" A more radical voice-over text can be heard in *War Collection of Films №5:* "The two greatest democratic states of the world rose in defense of the mankind against fascism - USSR and Great Britain!"

The same goes with the plots of films about the struggle of eastern-European partisans (a short story "100 for One" from *War Collection of Films №2,* a short story "At Seven Sharp" from *War Collection of Films №7,* a short story "A Night at Belgrade" from *War Collection of Films №8,* a short story "Blue Cliffs" from *War Collection of Films №9,* "Yan the Elusive"). Here one should give credit to the efficient reaction of the Soviet film production industry to the current political situation. In the short stories "Block 14" (*War Collection of Films №9,* March, 1942) and "The Priceless Head" (*War Collection of Films №10,* 1942) the authors sympathize with the Polish anti-Nazi Resistance movement that was inspired, if the authors are to be trusted, by the support of "the Red Army and Stalin, the leader of working people". In the story "The Priceless Head" the authors also sympathetically show a character from a Jewish ghetto in Warsaw...

We would remind you that two decades ago (1920-1940) Poland was regarded both in the realistic politics and in the then mediatexts (the press, radio, and cinema) as one of the chief opponents of the USSR. And the territorial division that took place in September, 1939, according to a collusive treaty between Germany and the USSR inspired, for example, an extremely significant film "The Wind from the East" directed by A. Room (1940) that described the Polish establishment as malicious and cruel oppressors of common people of Western Ukraine who enthusiastically welcomed the Soviet troops at the end of the film…

Moreover, though not only German but also Italian, Rumanian, Hungarian and Slovakian divisions fought against the Soviet Army in real life the Kremlin apparently considered it politically important to inform a general audience about the existing resistance even in these countries allied with the Nazi regime. A short story "Young Wine" from *War Collection of Films №10* (1942) describing the activity of Rumanian partisans is an example of the fact.

In whole the ideological and political world outlook contexts depicted in Soviet feature film media texts of 1941-1942 on the military theme can be represented in the following way (Table 1):

Table 1. Ideology and political context of the outlook represented in soviet feature films of 1941-1942 on the military theme

Key questions to media texts	Representation of the USSR world	Representation of the enemy's world
What is the ideology of this world?	Communist ideology in Stalin's interpretation	Imperialistic / Nazi aggressive ideology
What outlook does this world present - optimistic or pessimistic?	Optimistic throughout the action (a typical phrase from *War Collection of Films №2* addressing the enemy: "You won't eat our lard, bastards! And you won't eat our bread either!")	Presumptuous -optimistic, pessimistic
What is the hierarchy of values according to this outlook?	Patriotism - communist party - Stalin - people - hatred for the enemy - family	Aggression - imperialism / Nazism - enrichment; Aggression – cruel treatment of enemies - scornful of the inferior
What values can be found in this media text? What values dominate in the end?	Patriotic, communist values (during the whole action)	Imperialistic, Nazi values, fear of death (the latter especially prevails in media texts of 1942)
What does it mean to be a success in this world? What person succeeds in this world? What conduct is rewarded in this world? To what extent is it stereotyped?	It means to be a communist, Leninist-Stalinist, a patriot, a brave soldier who has no mercy on the enemy, a good family man. These are common stereotypes for positive characters who can also possess some individual traits (humor, vocal talent)	It means to be an imperialist/Nazi, a professional warrior who has no mercy on the enemy. These are common stereotypes for characters who can also possess some individual traits (wit, calculation, ruse, stupidity, cowardice, irony, sarcasm)

C. Cultural Context *How do media texts reflect, strengthen, or form the cultural context: relations, values, and myths?*

Mass culture media texts were a success due to multiple factors. These include: reference to folk and mythological sources; constancy of metaphors; successive introduction of the most durable plot schemes; synthesis of the natural and the supernatural; appeal not to the rational but to the emotional through identification (imagined transformation into personages, immersion in the text atmosphere), "the magic power" of the characters, standardization (replication, unification, adaptation) of ideas, situations, characters, etc., mosaic and serial character, compensation (illusive realization of cherished but unfulfilled wishes), a happy end, use of the rhythmic text organization where, for example, the audience's emotions are affected by the order of the frames change alongside with the plot; intuitive prediction of the audience's subconscious wishes, etc.

And here the Soviet films on the military theme of 1941-1942, a product of the mass/pop culture also rely on folk and mythological sources. In this connection both Alexander Nevsky, and Napoleon, and Chapaev with Shveik are referred to in *War collections of films*, in the first place, not as characters of historical and/or literary origin but as folk-mythological figures familiar to the public at large.

Practically all Soviet films of 1941-1942 on the military topic are characterized by serial character (for example, a *prequel* to a story about heroic Rybkin in *War Collection of Films №3* of 1941 and its further basic variant "Antosha Rybkin" shot in 1942 is a *sequel* of 1941 - "Chapaev is with Us"), standardization of ideas, situations, characters, etc. The compensatory factor of cherished dreams realization become apparent in the majority of Soviet films of 1941-1942 where regardless of the real situation at the front positive characters would beat the Hitlerites.

D. Genre Modifications: drama (64 films), detective (2 films). Taking into account the genres of feature short stories of *War Collections of Films* they shot 33 dramas, 7 comedies and 1 detective in 1941; 31 drama, 3 comedies and 1 detective in 1942. The overwhelming majority of these films were short due to the understandable necessity for fast response to current events. For instance, in 1941 only one feature film on the war theme with a length time longer than 60 minutes was created, but in 1942 there were five films.

Though the best scriptwriters, film makers and actors of that time (see the filmography) were involved in creating of films on the war theme in 1941-1942 the stylistics of such films did not differ much from the film stylistics of the previous decade except for more realistic representation of military life.

The dramatic stereotype: Nazis destroy a peaceful, tranquil and happy life of people; after occupying a town or a village they start a mass terror (shootings, executions, tortures, etc.) against the civilian population including women and children, drive away Russian people as captives to work in Germany, etc. The nation rises to fight with the enemies: in the regular army, in partisan detachments, clandestine organizations (subversive acts of partisans and spies, shootings of Nazis, etc.). At the same time, spies, saboteurs and traitor of the country are unmasked...

Techniques of reality representation (iconography) - setting, living conditions, etc.

Simple dwellings, offices and households of Soviet characters; apparently a more prosperous standard of life of German characters, unified Soviet and German military facilities, equipment.

Life of Soviet people (mainly, military men) and/or partisans from Eastern European countries is shown as a rule conditionally truly and always positively; a well-to-do mode of life of German characters in Germany is depicted with some grotesque but in general it is also quite true; the lifestyle of German characters at the front or in the occupied Russian territories is rather poor (in particular, in winter when Germans get frozen from extreme cold).

Details: Soviet war losses and especially the losses in civilian population - in films shot in 1942 are shown with moderation. In films of 1942 heavy human losses of the USSR are no longer concealed, on the contrary, casual episodes of documentary films about Nazi victims call for ruthless revenge on the hated enemy. The films soundtracks contain both encouraging marching 'offensive' songs ("Rise, our vast country...") and lyric melodies.

Generally, the representation of reality in Soviet feature films of 1941-1942 on the war topic can be presented as in Table 2.

Table 2. Typical iconographic setting codes in soviet feature films of 1941-1942 on the military theme

Codes of typical setting in media texts	Visual characteristics of these codes realization in media texts
Dwelling place of the enemy	Looks more prosperous than dwelling places of Soviet characters, but according to the plot this treasure is ill-gotten.
Dwelling place of the Soviet character	Poor but of good quality. The officers' quarters are nearly equal to the dwelling conditions of German burghers.
Army premises (headquarters, dugouts, etc.), trenches	Functional furniture - tables, chairs/armchairs, etc. In the Soviet variant everything is of good quality but very simple (though, the portraits of leaders on the walls are obligatory). The interior in the enemy premises is similar but grim (if the premises are located in Germany), dirty, untidy (if the premises are located in the front-line area and in the occupied territories)
Aircraft, tank, ship	Only functional articles of furniture - a cabin, levers and control device, weapons, partitions, etc.

Typology of characters (their values, ideas, ethics, clothing, constitution, vocabulary, mime, gestures)

Male Characters

Character's age: 10-70 years old (though sometimes very small children are in picture)

Character's race: white.

Character's appearance, clothes, constitution:

a) military men: Soviet characters are dressed in a uniform of good quality and are, as a rule, very robust; Nazis, on the contrary, are very feeble and look battered in most cases (especially in films with the winter nature of 1942), for example, they can go with woman's shawls or scarves tied round their heads; in whole, two basic variants of Nazi constitution are underlined - either overweight or, vice versa, thinness; foreign partisans (Polish, Yugoslavian, Czech, Rumanian) are dressed in accordance with the European "middle-class" fashion of the early 1940s;

б) civilian population: Soviet characters are modestly dressed (especially the rural community), the Germans look obviously richer; the constitution both of Soviet and German characters varies and depends on the film context; at the same time, physiognomically the enemy characters unlike the Soviet characters look disagreeable.

Educational attainment: higher education (officers), secondary and elementary education, more rarely - higher (civilian population, soldiers).

Social standing, profession: the social status of Soviet characters is approximately similar (though the living conditions of commanding officers are much more comfortable); the social status of foreign characters is different; a wide range of professions dominating with military men.

Character's marital status: has no special significance, both positive and negative characters can be either married or single.

Character traits: power, quick wit, activity, loyalty, optimism, bravery, tenacity of purpose (Soviet characters, characters of the countries conquered by Nazis), hostility, slyness, cruelty, cowardice, meanness, purposefulness (German characters). Soviet characters are honest fighters for their Motherland and communist ideas with businesslike or pathos vocabulary, reserved gestures and mime. German characters (soldiers, officers, spies) are shown as malicious, rude and cruel fanatics with primitive vocabulary, active gesticulation and annoying timbres of their shrill yells. However, already in films made in 1942 the Nazis were depicted sometimes as vicious but clever enemies as for example in the following short stories: "Spiders" and "102nd Kilometer" from *War Collection of Films №11* or in the film about pilots "The Way to the Stars" directed by E. Pentslin. N. Okhlopkov and M. Strauch in *War Collections of Films №7* and *№11* "went beyond the scope of caricature. N. Okhlopkov played a German officer with a monocle who went into ecstasies

at seeing a harmonium. He enchanted a Dutch family with his courtliness of conduct, gentle modulations of his baritone in order to efficiently rob their house the following day. The story was called "The White Crow". M. Strauch played a philosopher-killer dressed in a white overall with a syringe in his hand in the story "Spiders". These were expressive figures: they were not characters yet but they were no longer simple caricatures" [Zak, 1975, p. 41].

However, generally speaking, the characters of the personages - both Soviet and German - are given only in outline without a deep psychological insight. Enemy characters speak Russian (for the viewer's convenience) but sometimes with a German accent. In rare instances one can hear some German remarks.

Character's value orientations (ideological, religious, others): patriotic, communist values (Soviet characters), imperialist, Nazi values (German characters), religious values, as a rule, go beyond the scope of media texts.

Conduct of a character, his strategy of conflict resolution: acts of characters are determined by the development of the media text plot. Soviet characters demonstrate their best professional/military qualities, brilliantly work out and realize plans for enemy liquidation. German characters either stand on the defensive or attack but all the time suffer a defeat. Cruelty and ruthlessness towards even civilian population dominate in Nazis' behavior. In films shot in 1942 Wehrmacht soldiers and officers do not conceal their despair and lack of fighting spirit.

Female Characters

Character's age: 10-70 years old (though sometimes very small girls are in picture).

Character's race: white.

Character's appearance, clothes, constitution: Soviet characters, as a rule, have average constitution, are dressed in plain civilian attire, more rarely - in military uniform. Foreign characters can be divided into two distinct categories - women of the countries occupied by Nazis are shown with compassion, but the German women are always negative characters (the latter are obviously more richly dressed but are physiognomically repulsive)

Educational attainment: secondary and elementary education.

Social standing, profession: the social status of Soviet characters is approximately alike; the social status of foreign characters differs; women-workers of various professions are represented, more rarely - nurses, women-partisans.

Character's marital status: women over 18 are usually married.

Character traits: power, quick wit, activity, loyalty, optimism, bravery, firmness of purpose (Soviet characters, characters of the countries conquered by Nazis), hostility, slyness, cruelty, cowardice, meanness, purposefulness (German characters).

Character's value orientations (ideological, religious, others): patriotic, communist values (Soviet characters), bourgeois, Nazi values (German characters), religious values, as a rule, go beyond the scope of media texts, however, sometimes they are emphasized (an elderly peasant woman in "A Feast in Zhirmunka").

Conduct of a character, his strategy of conflict resolution: characters' behaviour is determined by the plot of a media text. Soviet characters demonstrate their best professional/military qualities, their ability to drastically resolve conflicts.

Significant changes in the media text plot and characters' lives, the incipient problem

Positive Soviet characters either live a peaceful life in the beginning (it takes the minimum film time) or immediately find themselves in the wartime and do their best to repel the Nazi aggression. Negative characters commit aggression/crime and despite some local initial successes they inevitable suffer defeat at the end of the film. Their remarks are often full of pessimism.

Details: a German ace (ironically played by N. Volkov) from "The Way to the Stars" grumbles at seeing their fresh reinforcement: "How old are you? - Forty-three, - And you? - Forty-five, - I need pilots but not bats". It is also he who says another sarcastic phrase: "Can't sleep, lieutenant? Then think of the Russian pilot who will shoot you down"...

Incipient problem, search for solutions to the problem

Incipient problem: violation of the law - the life of positive characters is under threat because of the Hitler aggression. The only solution is the armed struggle of positive characters against the enemy aggression.

Solution to the problem: liquidation/capture of aggressors, victory of Soviet soldiers/partisans.

Conclusions. Thus we performed a hermeneutic analysis (investigation of media texts interpretation, cultural and historical factors influencing the views of the agency / author of a media text and the audience) of specific examples of Soviet feature films of 1941-1942 on the military theme. At the same time, we mean that the hermeneutic analysis of a media text comprehension involves a comparison with a historical, cultural tradition and reality; insight into its logic; comparison of media images in historical and cultural contexts combined with the historical, hermeneutical analyses of the structural, plot, ethical, ideological and iconographic / visual analyses of media stereotypes and media text characters.

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Filmography:

Part 1. War Collections of Films (1941-1942)

War Collection of Films №1. USSR, 1941. Premier: 2 August 1941. Directors: I. Mutanov, Ye. Nekrasov, A. Olenin, S. Gerasimov. Script writers: B. Laskin, L. Leonov, L. Lench, G. Kozintsev, L. Trauberg. Cameramen: N. Naumov-Strazh, Yu. Fogelman, V. Yakovlev. Composer: N. Kryukov. Cast: B. Chirkov, N. Petropavlovskaya, P. Pepnin, V. Kantsel, M. Troyanovsky, N. Bubnov and others.

Three short films: "A Meeting with Maxim", "A Dream Come True", "Three Men in a Shell Hole".

War Collection of Films №2. USSR, 1941. Premier: 11 August 1941. Directors: Ye. Chervyakov, V. Eisymont, L. Arnshtam, G. Rappaport, G. Kozintsev, V. Feinberg. Script writers: Yu. German, V. Voevodin, I. Zeltser, L. Arnshtam, V. Belyaev, Ye. Ryss, A. Shtein, M. Rosenberg. Cameramen: A. Ksenofontov, Ye. Velichko. Composer I. Dunayevsky. Cast: Ye. Chervyakov, T. Sukova, B. Blinov, L. Yemelyantseva and others.

Three short films: "A Meeting", "One Among Many", "At the Old Nurse's, "100 for One", "An Accident at the Telegraph".

War Collection of Films №3. USSR, 1941. Premier: 22 August 1941. Directors: B. Barnet, Peter Baylis, K. Yudin. Script writers: I. Boldin, L. Shiffers. Cameraman: K. Vents. Composers: N. Krykov, G. Milyutin. Cast: V. Arkasov, V. Shishkin, N. Trofimov, B. Chirkov and others.

Three short films: "English Anti-Aircraft Gunners" (British Newsreel), "Courage", "Antosha Rybkin".

War Collection of Films №4. USSR, 1941. Directors: G. Aleksandrov, E. Aron, V. Pronin. Script writers: A. Raskin, K. Isaev, Ye. Pomeschikov, G. Fish, N. Rozhkov. Cameramen: K. Nazariants, A. Galperin, V. Pronin, A. Shelenkov. Composer: L. Schwarz. Cast: L. Orlova, Z. Fedorova, V. Volodin, Ye. Kuzyurina, P. Springfeld, A. Baranov, A. Fait and others.

Three short films: "British Fleet" (British Newsreel), "A Patriot Woman", "The Order Is Executed".

War Collection of Films №5. USSR, 1941. Director M. Slutsky. Script writer A. Kapler. Cameramen: I. Veynerovich, M. Glider, K. Kutub-Zade, O. Reisman, V. Solovyov, V. Frolenko. Composers: G. Milyutin, A. Aleksandrov.

Two documentary short films: "London Does Not Give Up" (British Newsreel), "Our Moscow".

War Collection of Films №6. USSR, 1941. Directors: M. Doller, V. Pudovkin, V. Winestock. Script writers: L. Leonov, N. Shpikovsky, V. Winestock. Cameramen: A. Golovnya, T. Lobova, A. Galperin. Composer N. Kryukov. Cast: Z. Fedorova, A. Danilova, N. Kryuchkov, V. Uralsky, A. Zueva and others.

Three short films: "Women of the Air Fleet" (Newsreel), "Hatred", "A Feast in Zhirmunka".

War Collection of Films №7. USSR, 1941. Premier: 5 December 1941. Directors: A. Gendelstein, K. Mints, S. Yutkevich, A. Rou, L. Altsev, R. Perelstein. Script writers: M. Vituchnovsky, M. Volpin, K. Mints, A. Sazonov, N. Erdman, D. Eremich, Jo. Manevich. Cameraman Jo. Martov. Cast: E. Garin, P. Olenev, N. Okhlopkov, V. Vladislavsky, K. Zubov, I. Lyubeznov, N. Plotnikov, N. Barskaya, G. Georgiu, V. Lepko, S. Martinson, A. Shatov, V. Kantsel, V. Popov, M. Yanshin and others.

Six short films: "At Seven Sharp", "Elixir of Courage", "Acceptor of Catastrophes", "The Boldest Man", "A Real Patriot", "The White Crow".

War Collection of Films №8. USSR, 1941. Premier: 7 February 1942. Directors: L. Lukov, N. Sadkovich. Script writers: V. Ivanov, Jo. Sklyut. Cameramen: A. Lavrik, N. Kulchitsky. Composers: N. Bogoslovsky, A. Philipp. Cast: T. Okunevskaya, N. Gitserot, O. Abdulov, I. Novoseltsev, P. Aleynikov, L. Masokha, V. Zaychikov, S. Kayukov, A. Khvylya, B. Andreyev, M. Bernes and others.

Two short films: "A Night over Belgrade", "Three Tankmen".

War Collection of Films №9. USSR, 1941. Premier: 4 May 1942. Directors: V. Braun, M. Donskoy, I. Savchenko. Script writers: Yu. Olesha, S. Lazurin. Cameramen: A. Mishurin, D. Demutsky, Yu. Yekelchik,. Composers: Yu. Meitus, Ya. Stollyar. Cast: V. Mironova, B. Runge, N. Komissarov, N. Bubnov, L. Kmit, Ya. Andzheyevskaya, M. Bernes and others.

Three short stories: "Block 14", "Blue Cliffs", "The Lighthouse".

War Collection of Films №10. USSR, 1941. Premier: 10 June 1942. Director B. Barnet. Script writers: B. Petker, K. Isayev. Cameraman K. Vents. Composers: N. Kryukov, L. Stepanov. Cast: V. Orlova, N. Cherkasov, V. Shishkin, V. Uralsky, M. Goldblat, M. Astangov, N. Bogolyubov, M. Kuznetsov and others.

Two short films: "The Priceless Head", "Young Wine".

War Collection of Films №11. URRR, 1942. Premier: 7 August 1942. Directors: V. Braun, A. Macheret, N. Sadkovich, I. Trauberg. Scrip writers: B. Fayans, M. Berestinsky, B. Laskin, Jo. Sklyut. Cameramen: Ya. Kulish, G. Eisenberg. Composers: D. Block, D. Klebanov. Cast: S. Martinson, I. Pereverzev, I. Novoseltsev, N. Volkov, O. Abdulov, P. Aleynikov, I. Bobrov, A. Lukyanov, M. Strauch and others.

Four short films: "In the Circle of Hate", "Spiders", "'102nd Kilometer", "The Career of Lt. Gopp".

War Collection of Films №12. USSR, 1942. Premier: 12 August 1942. Directors: G. Rappaport, V. Stroyeva. Scrip writers: S. Mikhalkov, S. Polotsky, Jo. Prut, M. tevelev, M. Bolshintsov, G. Musrepov. Cameramen: V. Rappaport, S. Sheynin. Composer V. Velikanov. Cast: Ya. Zheimo, Yu. Bogolyubov, O. Zhakov, K. Badyrov, M. Zharov, B. Blinov, Ye. Nemchenko, L. Yemelyantseva, N. Cherkasov, M. Sobolevskaya, K. Sorokin, A. Danilova and others.

Two short films: "The Son of a Soldier", "Vanka".

War Collection of Films "Our Girls". USSR, 1942. Directors: A. Room, G. Kozintsev. Script writers: B. Brodyansky, A. Olshansky. Cameramen: B. Brodyansky, A. Olshansky. Cameramen: L. Kosmatov, A. Moskvin. Composers: G. Popov, S. Prokofyev. Cast: V. Karavayeva, S. Stolyarov, L. Shabalina, L. Yemelyantseva, B. Bibikov, Yu. Korshun, A. Yachnitsky, Yu. Bogolyubov, B. Olenin, M. Kuznetsov, N. Petropavlovskaya and others.

Two short films: "Tonya", "One Night" *(was not released).*

War Collection of Films "Forest Brothers". USSR, 1942. Directors: V. Zhuravlev, Ye. Shneider. Script writers: V. Zhuravlev, Ye. Pomeschikov, N. Rozhkov. Cameramen: G. Garibyan, G. Yegiazarov. Composer A. Lepin. Cast: A. Ivanov, S. Svashenko, M. Kovaleva, B. Tenin, P. Sukhanov, A. Fait, S. Troitsky, A. Gretchany, M. Troyanovsky and others.

Two short films: "Forest Brothers", "Dad's Death".

War Collection of Films "Young Partisans". USSR, 1942. Premier: 12 August 1942. Directors: L. Kuleshov, I. Savchenko. Script writers: V. Vasilevskaya, L. Kassil, Ye. Pomeschikov, N. Rozhkov, G. Tasin. Cameramen: Yu. Yekelchik, M. Kirillov. Composer S. Pototsky. Cast: G. Stepanova, P. Galadzhev, A. Dunaysky, H. Klering, S. Martinson, A. Fait and others.

Two short films: "Levko", "Teacher Kartashova".

<u>Part 2. Other soviet feature films of 1941-1942 on the war theme</u>

1941

In the Sentry Box
In the Black Mountains
Blood for Blood
Mother
Sea Hawk

We'll Win. 1941.
To the Call of the Leader. 1941.
Fire in the Forest. 1941.
Brave Friends
The Last Turn
Prokhorovna
Good Morning
A Family of Patriots
The Old Guard
The Son of the Motherland
Lessons of the Soviet Language
The Outpost
Chapaev is with Us
1942
Antosha Rybkin
Bakhtiar
Belorussian Novels
Battle of Sokol
In Underwater Captivity
Mittens
The Way to the Stars
Daughter
Timur's Oath
Bridge
The Unconquerable
Yan the Elusive
A Fellow from Our Town
The Partisans in the Ukrainian Steppes
Secretary of the District Committee
The Son of Tajikistan
To You, Front

Герменевтический анализ советских фильмов 1941–1942 годов на военную тему

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Аннотация. В статье автор делает герменевтический анализ культурного контекста советских фильмов на военную тему 1941-1942 годов. Автор имеет в виду, что герменевтический анализ понимания медиатекстов включает сравнение с исторической, культурной традицией и действительностью; понимание его логики, сравнение медиатекстов в историческом и культурном контексте в сочетании с историческим, структурным, сюжетным, этическим, идеологическим и иконографическим/визуальным анализом медийных стереотипов и персонажей медиатекста.

Ключевые слова: медиатекст; анализ; медиаобразование; компетентность; советские фильмы 1941-1942 годов о войне.

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Moscow Media Education Centers for Non-professionals in the Media Fields

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Abstract. The analysis of the basic media education models used in Moscow media education centers has shown that nowadays the synthetic media education models are most typical; they are based on the synthesis of the sociocultural, educational and informational, practical and utilitarian models. And they lean towards the maximum usage of media education potential depending on the aims and objectives; they are characterized by variability, and the capacity to entirely or partially integrate into the education process. The suggested media education technology is based as a rule on blocks or modules of creative and role play/gaming assignments for the teachers to use both in school and out-of-school activities. An important peculiarity of the analyzed models is that they have a wide field of application: schools, universities, institutions of additional education and leisure activity. Media studies may be organized in the form of lessons, optional classes, and special courses integrated into different school subjects, or used in school societies.

Keywords: Russia; Moscow; media education literacy; media culture; media competence.

Introduction. The comparative analysis of Russian media education centers is closely connected not only with their goals and objectives but also with the typology problem of media education theories. In this connection Irina Fateeva suggests using a generalized term “action / activity theory” instead of the traditional pool of such theories (cultural studies theory, semiotic, socio-cultural, aesthetic, practical and other theories). This dominant practical approach is aimed at:

- adequate appreciation of media texts as human production, understanding of their origin and circulation, their critical assessment and well-grounded judgment of them;
- participant observation of mass media social functioning (both on the system and component levels), the audiences’ media participation as conscious media consumers;
- dialogue-oriented media participation based on modern technologies;
- media creation based on the audience’s participation in media education projects of a varied scale” [Fateeva, 2007, p. 34; Fateeva, 2008, p. 140-147].

Having analyzed the media education theories developed by media educators from different countries Irina Fateeva concluded that “to derive a media education theory from communication theories is not only unreasonable but also destructive since that initially causes conceptual disunity of teachers and their pupils intensified by moral and ethical problems: after failing to reach a consensus in the dispute the teachers are apt to impose their arguable views on the audience” [Fateeva, 2007, p. 25-26].

Such obvious rejection of conceptual approaches to media education is far from being undoubted. And the categoricity of the assertion also sounds bewildering: why are teachers sure “to impose their views”? Can the mutual process of correct comparative analysis of different theories and/or conceptions together with the audience fail to be fruitful?

Moreover, a thorough examination of each theoretical media education conception shows

that all of them include media activity/action in a way, as a practical component of education.

On the one hand, we could deny with Irina Fateeva the theoretical peculiarities of this or that media education centre and confine ourselves to mentioning the unified "theory of media action" which is indeed characterized by a wide degree of generalization (and, neither Yury Usov nor Lev Pressman would object to its definition/formulation). But on the other hand, one cannot avoid in this case the loss of "creative individuality" of this or that media education centre, e.g. the aesthetically/artistically oriented media education conception of Yury Usov.

The total number of Russian most significant media education centers is more than ten. In this article we analyze the activities of Moscow media education centers. Besides we took into consideration chiefly the media education centers whose activities (in a varying degree) are aimed at ***mass media education***. That is why we describe the activities of numerous Moscow faculties of journalism, film and advertisement which train exclusively media professionals.

At the same time, we analyze the work of the Moscow State University media education centre exactly because during the last 7-8 years its leaders have attempted to extend the traditional scope of professional media education by arranging systematic (especially during the last two years) activities and events aimed at mass media education of school students and teachers.

Brief characteristics of Moscow media education centers

Thus, we single out five leading Moscow media education centers:

- Screen Arts Lab of Artistic Education Institute of the Russian Education Academy;
- Media Education and Technical Teaching Means Lab of the Educational Methods and Contents Institute of the Russian Academy;
- The Moscow City experimental platform "Media Education Technologies and New Teaching Forms in the Modern Educational Institution";
- Labs of experimental research coordination of the General Secondary Education Problems Centre of the Educational Methods and Contents Institute of the Russian Academy;
- Faculty of Journalism, MSU;
- Public organization – League of Young Journalists of Russia (YUNPRESS).

It should be also mentioned that the majority of the Moscow media education centers' staff are members of the Russian Association for Film & Media Education (http://edu.of.ru/mediaeducation) which unites hundreds of school teachers, university teachers, additional education institutions' workers, culture and non-profit public organizations' workers from different Russian cities.

1. Name of the Media Education Centre: Screen Arts Lab of Artistic Education Institute of the Russian Education Academy (http://www.art-education.ru/otd-dop-ekran.htm).

2. Year of establishment, location: 1974, Moscow.

3. Financing sources: state funding (till 1992), state funding and grants of different funds (since 1992).

4. Direction: Professor Dr. Yury Usov (1974-2000); Dr. Larisa Bazhenova (since 2000).

Yury Usov (28 July, 1936 – 27 April, 2000): Brief Biography

During many years Prof. Dr. Yury Usov was an undisputed leader of Russian media education movement, a board member of the Russian Association for Film & Media Education.

Two years after graduating from the Cinematography Faculty of the All-Union State Institute of Cinematography (1972) he successfully defended a Ph.D. thesis and became Head of the Film and Television Lab (the Artistic Education Institute of the Education Academy). He initiated a number of wide-scale experiments in film education in many schools of the Russian capital in the first half of the 1980s. It was he who gave a thorough and detailed description of the ***aesthetic/artistic theory of media education***.

Prof. Dr. Yury Usov actively promoted media education in schools, Moscow Cinema Lyceum, teachers' training courses in film education; he supervised PhD. students' research, wrote a number of books on the theory and methodology of film and media education in schools.

His first articles were published in the 1970s in Russian collections of scientific works and journals *(Soviet Screen, Pedagogika, Public Education, Television and Radio Broadcasting, Specialist, Arts and Education, Art in School*, and others). He took part in several international conferences on film education and artistic education; was one of the organizers of the Russian-British seminars on media education in the middle of the 1990s.

Bibliography (Yury Usov's books in Russian):

Usov, Y. (1980). *Methology of Using Film Art for Aesthetic Development of Senior School Students (Grades 8-10)*. Tallinn.
Usov, Y. & Rudalev, V. (1983). *Methology of Using Film Art in Educational Process*. Moscow.
Usov, Y. (1986). *Program of the Optional Course "Basics of Cinema Art" (Grades 9-11)*. Moscow.
Usov, Y. (1987). *Film Art in the Aesthetic Development of School Students (Grades 7-10)*. Tallinn.
Usov, Y., Bazhenova, L. et al. (1991). The *Basics of Audiovisual Culture*. Moscow.
Usov, Y. (1993). *The Basics of Screen Culture*. Moscow.
Usov, Y. (1994). *In the World of Screen Arts*. Moscow.
http://edu.of.ru/mediaeducation
http://edu.of.ru/medialibrary

Books, articles about Y. Usov (in Russian):

Fedorov, A. (2003). Media Pedagogy of Y. Usov. In: *Art and Education*. № 3, p. 65-74; № 4, p. 78-95.
Fedorov, A., Tchelysheva, I., Muryukina, E., et al. (2007). *The Aesthetic Conception in Russian Media Education and Creative Heritage of Y. Usov*. Taganrog.

Larisa Bazhenova: Brief Biography

Ph.D., member of the Russian Association for Film & Media Education. Worked as senior scientific associate for the Screen Arts Lab of the Artistic Education Institute of the Russian Education Academy. After Y. Usov's decease (2000) she became head of the laboratory in the present-day Artistic Education Institute of the Russian Education Academy. Under the supervision of Prof. Usov she repeatedly took part in practical experiments in film education of school students. Used to teach in the Moscow Cinema Lyceum for some years. Now teaches in different educational institutions of Moscow. Participated in many Russian and international conferences.

Larisa Bazhenova is the author of numerous articles on film education published in Russian journals: *Primary School, Art and Education, Art in School, Specialist, Family and School, Media Education et al.*

***Bibliography (*Larisa Bazhenova's books in Russian):**

Bazhenova, L. (1992). *In the World of Screen Arts*. Moscow.
Bazhenova, L. (1995). *Our Friend, the Screen. Issue 1 and 2*. Moscow.
Bazhenova, L. (2004). *Media Education of the School Student (Grades 1-4)*. Moscow.
http://www.art-education.ru/otd-dop-ekran.htm
http://edu.of.ru/mediaeducation
http://edu.of.ru/medialibrary

5. Target Audience: school students of different age-groups, school teachers.

6. Chief aim: research of screen arts' potential (film, TV, video) in students' artistic education and media education, personality development on art media texts.

7. Objectives:

- research and analysis of media education experience;
- experimental, aesthetic, ethical, audio-visual, emotional and intellectual media education of school students developing: various types of active thinking (imaginative, associative, logical and creative thinking); perception, interpretation, analysis, and aesthetic appreciation of media texts; need for media language acquisition in communicating with both screen and traditional arts products and mass media; need for verbal communication to exchange views on the acquired information, and in artistic and creative activities; abilities to impart the knowledge gained at media education lessons; skills to represent the results of their personal perception of different arts, the surrounding world via communication technologies in the form of multimedia and audio-visual (video creation, computer-generated imagery) and written texts;
- holding of conferences and seminars on media education;
- arranging of optional and compulsory media education courses for schools students, teachers' extension courses;
- post-graduate media education research.

8. Working definition of media education:

Y. Usov defines *media education* as "a system of using mass communication and information media (press, radio, film, TV, video, computers, and photography) in a student's individual development. The system itself, unlike the traditional school subjects aimed at knowledge acquisition, suggests in the first place introducing the artistic and creative activities shaping the

student's emotional and intellectual development" [Usov, 1998, p. 55]. He also introduced the concept of "audio-visual culture as a definite system of the student's levels of aesthetic development on the screen arts material: needs level, education level and audio-visual thinking level" [Usov, 1989a, p. 21].

9. Key media education theories: aesthetic and cultural studies media education theories.

10. Media education model units: ascertaining experiments aimed at detecting the initial levels of students' of different ages aesthetic development in screen arts; "forming" experiments aimed at school students' aesthetic film/media education; final ascertaining experiments aimed at detecting the changes occurred in the course of the "forming" experiments. In general, Y. Usov's model integrates the study of screen, traditional arts and communication technologies. The model contents are defined by "the concept of the aesthetic culture as a system of the students' emotional and intellectual development levels of imaginative, associative and logical thinking, perception of fiction and fact, interpretation skills, media evaluation skills, need for artistic and creative activities on the material of the traditional arts and various mass media (film, TV, video, press, radio, computer and multimedia technologies)" [Usov, 1998, p. 56].

According to Y. Usov, this model can be realized in the form of specialized and integrated media education. Moreover, the model can be applied in different variations and correlations, and that is by itself, in our opinion, very essential namely for Russia (due to different living conditions in big cities and remote regions, financial instability of education).

Usov's model is directed at the effective development of such important aspects of basic *personal culture* as: active thinking (including imaginative, creative, logical, critical, and associative thinking); perception, interpretation, assessment and analysis of media texts; need for media language acquisition and qualified usage; need for verbal communication in the course of media information perception; knowledge communication skills and perception/reflection sharing skills via media [Usov, 1998, p. 56].

Yury Usov [Usov, 2000a] is also the author of the educational model of virtual thinking development based on the unity of video production and reflection on its results. The perception and analysis of the art/screen media text is achieved by video production of a picturesque scene; video material editing/montage; detecting of semantic, emotional interrelations between discrete elements; conception development of the watched episode; opinion development and verbal communication; a coherent analysis of the screen version and so on [Usov, 2000a, p. 3-6].

The concept of virtual reality has greatly changed of late. It used to be considered as something similar to artistic reality but due to the intensive development of computer technologies the virtual reality does actually appear on the inner screen of the person's mind, linking him/her with any media text, either his/her own or somebody else's.

That prompted the idea of the so-called virtual thinking which, according to Y. Usov, is able to resolve the contradictions between the level of achievements in the field of the art's aesthetic impact and the present day man's readiness to actively use these possibilities: both at specialized lessons and personally when perceiving and interpreting multivariate space-and-time reality.

The virtual thinking is closely connected with the history of the screen arts development, and with all types of studying the space-and-time reality (montage, audio-visual, space-and-time, screen). Undoubtedly, the development of the virtual thinking is one of the progressive fields of media education in the modern information society.

An important feature of Y. Usov's model is the integration of screen, electronic and new ICT in the systems of basic and additional education, and in out-of-school students' activities.

11. Organizational forms: media education integration into school students' academic, out-of-school and leisure activities. Here four types of activities are distinguished: 1) learning about media arts and their functioning in the society; 2) looking for a media text message communicated through the space-and-time form of narration; 3) interpreting the results of perception, aesthetic evaluation of a media text; 4) artistic and creative activity in screen arts [Usov, 1989a, p. 7-8].

12. Teaching methods:

According to the knowledge sources: *verbal methods* (lecture, description, debate, explanation, discussion); *visual methods* (illustration, demonstration of media texts); *practical methods* (practical assignments on media material). According to the level of cognitive activity: *explanatory and illustrative* methods (the teacher gives some information about the media, media culture, and the audience assimilate the information); *reproductive methods* (the teacher works

out a system of various exercises and tasks on media texts for the students to master the methods of solving them); *problem-solving methods* (problem analysis of some situations or media texts aimed at developing the audience's critical thinking); *heuristic, research methods* (the teacher creates conditions for the students' research and creative learning). Preference is given to students' media texts perception and analysis, to the system of role-play/creative lessons, practical lessons in video filming, etc.

13. Media education program contents (based on the key concepts of media education: *media agency, media category, media technology, media language, media representation, media audience*):

- introduction to media education (the definition of media education, media text, the main criteria for its evaluation, media creation, etc.);
- media reality in school media education (means of the visual image, media culture and the model of its development, etc.);
- man and environment, the possibilities for its study, comprehension and identification (correlation between the perceptive units, different means of establishing these interconnections; information space, its interpretation through word, music, image, etc.);
- technologies improving the human environment and modeling the human mind (media technology development, modeling of the world and the human mind, etc.)
- philosophic, aesthetic, and cultural evaluation of mass media; the peculiarities of the digital society, the narration and impact of modern media, modern ICT potential, etc.

14. Application fields: Compulsory and optional subjects (in specialized educational institutions (lyceums, vocational schools); teachers' extension courses), society classes (clubs, studios, institutions of additional education and leisure). The film/media education programs can be applied within the framework of artistic and aesthetic subjects (*World Artistic Culture*, *Basics of Media Culture, etc.*), literature, history, foreign language studies, etc. For instance, the subject *Media Studies* can be part of different school subjects, or can be taught as an independent special course. Since the problem of training professional media teachers in Russia has not been solved yet, such a varied approach is logical for Russian media education.

1. **Name of the Media Education Centre:** Media Education and Technical Teaching Means Lab of the Educational Methods and Contents Institute of the Russian Academy (http://www.mediaeducation.ru).
2. **Year of establishment, location:** 1965, Moscow.
3. **Financing sources:** state funding (till 1992), state funding and grants from different funds (since 1992).
4. **Direction:** Prof. Dr. Lev Pressman (1965-1993), Prof. Dr. Ludmila Zaznobina (1993-2000), Prof. Dr. Alexey Zhurin (2000-2004), Dr. Elena Bondarenko (2004 – now).

Lev Pressman (1924 – 1996): Brief Biography

One of the founders of the 'practical branch' of media education in Russia, Doctor of Education (1981), Professor (1982), Member of the Russian Union of Filmmakers. He graduated from Kuibyshev Pedagogical Institute (1948). Used to work as a school teacher (in the 1940s-1950s). Since 1960 began working at the Academy of Pedagogical Sciences of RSFSR (later – the Russian Academy of Education) where he headed the Lab of Technical Teaching Means from 1965 to 1993. In his old age he was chief research officer of the Russian Academy of Education.

For many years Lev Pressman initiated and headed numerous media education projects. He is the author of many books on the problem of using media in school. In the course of several decades he succeeded in developing an effective system of using ICT in school teaching literature and Russian, and an extensive film reader for literature classes. Lev Pressman composed scripts for more than 150 educational films, TV programs, diapositive films; had several teaching aids on media education published. He had his articles published in Russian journals: *Pedagogika, Cinema Art, Soviet Screen, Literature in School, Russian in School, Public Education, Family and School* and others, and also in scientific collections of articles. Frequently participated in different scientific conferences.

Bibliography **(Lev Pressman's books in Russian):**

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Pressman, L. & Kisenkov, V. (1972). *ICT in School*. Moscow.
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Pressman, L. (1988). *Teaching Methods of Using ICT: Screen and Sound ICT*. Moscow.
Pressman, L. (1993). *Video Recording in School*. Moscow.

Ludmila Zaznobina (1939-2000): Brief Biography

Doctor of Education, Professor, Ludmila Zaznobina headed the Lab for ICT Education and Media Education in the Russian Academy of Education from 1993 to 2000. For many years she supervised the experiment of media education and using ICT in Russian schools. She was one of the leading authors and the editor of the collective monograph 'Media Education Integrated into Compulsory Education', the author of the project 'Media Education Standard' (1998) for Russian secondary schools.

Ludmila Zaznobina is the author of many books on media education integrated into compulsory secondary school subjects, and teaching methods of chemistry. Her books were published in such Russian journals as *Public Education, Chemistry in School, Pedagogika, Educational ICT* and others.

Bibliography **(Ludmila Zaznobina's books in Russian):**

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Zaznobina, L. (Ed.) (1996). *Media Education*. Moscow.
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Zaznobina, L. (Ed.) (2000). *School ICT Equipment in Modern Conditions*.
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Alexey Zhurin (born September 30, 1955): Brief Biography

Doctor of Education (2005), member of the Russian Association for Film & Media Education. A. Zhurin graduated from Moscow State Pedagogical Institute (1977), worked as a teacher, deputy headmaster, research assistant (since 1998 – as a senior research fellow) of the Media Education and Technical Teaching Means Lab of the Educational Methods and Contents Institute of the Russian Academy. From the second part of 2000 to 2004 he headed this laboratory. Since 2004 he has been deputy director of research in the Educational Methods and Contents Institute of the Russian Academy. The main field of his research is developing the theory of making and using ICT methods in teaching chemistry and media education. He is the author of a number of articles on media education published in such Russian journals as *Pedagogika, Chemistry in School, Media Education* and others. He has also a number of published books on ICT; often took part in conferences and workshops.

Bibliography **(Alexey Zhurin's books in Russian):**

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Zhurin, A. (2009). *Integrated Media Education in the Secondary School (Natural Sciences)*. Moscow.
http://www.mediaeducation.ru
http://edu.of.ru/mediaeducation
http://edu.of.ru/medialibrary

Elena Bondarenko (born June 10, 1962): Brief Biography

Candidate of Education (1997), member of the Russian Association for Film & Media

Education. After graduating from the Film Critic Faculty of All-Union State Institute of Cinematography (1985) worked as a scientific assistant in the Lab of Screen Arts in the Artistic Education Research Institute of the Russian Academy of Education. Since 2004 she has been head of the Media Education and Technical Teaching Means Lab of the Russian Academy of Education. She is the winner of scientific grants of the Russian Humanitarian Scientific Fund (2000-2002, 2004-2006) and the program 'Renovation of the Humanitarian Education in Russia' of the 'The Open Society' Institute (1994). She was an organizer and leader of the training group at the workshops 'Media-95' (Russia - UK) and 'Media Education and the Problems of Educational Television' (Krasnaya Pachra, 1996), an expert of the All-Russian Scientific School 'Media Education and Media Competency' (2009). Participated in scientific conferences of the Russian Association for Film & Media Education and six media education festivals. Her research is focused on the development of teenage media culture. She is the author of numerous articles, teaching aids and programs on film and media education, has publications in such Russian journals as *Specialist, Pedagogika, Standards and Monitoring in Education* and others.

Bibliography **(Elena Bondarenko's books in Russian):**

Bondarenko, E. (1994). *Dialogue with the Screen*. Moscow.

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Bondarenko, E. (2000). *Theory and Methods of Social and Creative Rehabilitation by Audiovisual Culture Means*. Omsk.

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Bondarenko, E. (2003). *In the World of Cinema*. Moscow.

http://edu.of.ru/mediaeducation

http://edu.of.ru/medialibrary

http://www.mediaeducation.ru

5. **Target Audience:** school students of different age-groups, school teachers.

6. **Chief aim:** preparing school students for living in the information society (information competency and competent usage of data flows) through media education integrated into the system of compulsory education.

7. Objectives:

- research and analysis of media education experience;
- holding of conferences and workshops on media education problems;
- developing of media education courses for school students, teachers' extension courses;
- post-graduate media education and ICT education research supervision;
- teaching the audience (school students, teachers) to accept and process media information (in wide sense);
- developing the audience's (school students', teachers') critical thinking, understanding of the implied meanings of media texts, conscious resistance to mass-media manipulations;
- out-of-school information inclusion in the context of general compulsory education, in the system of the knowledge and skills formed within school subjects;
- developing students' skills to find, prepare, hand over and accept the required information, also using ICT (computers, modems, faxes, multimedia, etc.) [Zaznobina, 1996, p. 73; Zaznobina, 1998].

8. **Working definition of media education:** the former amorphous definition of media education offered by E. Zaznobina (media education is the preparation of *'students for the life in the information environment by the intensification of media educational aspects while teaching different school subjects'* [Zaznobina, 1998]) was replaced in the 2000s by a more systematized and strict definition offered by A. Zhurin. '*Media education is a pedagogical science which studies the mass media impact on children and teenagers and deals with theoretical aspects of preparing students for meeting with the media world; practical cooperative activity of the teacher and students preparing children and teenagers to use the media and to understand the role of mass media in culture and perception of the world; an educational sphere consisting in the knowledge of the mass media role in culture and perception of the world, and skills of effective interaction with media content'* [Zhurin, 2005, p. 51].

9. **Key media education theories:** practical theory, theory of developing critical thinking, and semiotic theory of media education.

10. **Media education model units:**

To a great extent L. Zaznobina's media education theory coincides with the media education

approach of V. Polevoy who proved in his research that students' thinking on the audio-visual level of perception will be considerably activated only on condition that they are given an opportunity to independently (to a certain or full extent) estimate and make out the essential and the inessential, the required and the accidental on the screen; to analyze, synthesize and generalize what has been seen [Polevoy, 1975, p. 8]. The traditions of the media education model offered by L. Zaznobina are being developed now in the Media Education and Technical Teaching Means Lab of the Russian Academy of Education. Thus, the model of media education integrated with the system of compulsory education suggests the following components: objective, contents, activity, technology and regulation [Zhurin, 2005, p. 30].

11. **Organizational forms:** media education integration into compulsory school subjects.

12. **Teaching methods:** According to the knowledge sources: *verbal methods, visual methods, practical methods;* according to the level of cognitive activity: *explanatory and illustrative* methods, *reproductive methods*, *problem-solving methods*, *heuristic, research methods*. The methods if integrated media education depend on the used educational means and their aims, organizational forms of the educational process. The alterations caused by integration on the level of these components lead to alterations in teaching methods. Moreover, alongside with the organizational forms that prompts the modification of the inner contents of teaching methods. The principal modification consists in the practical realization of the informational equality between the teacher and the students against the background of the participants' free choice of bifunctional educational means of the didactic process consisting in using bilateral analysis of the educational material presented by the chosen educational aids. The result is that the methods well-known to *the teacher* get enriched with the new techniques which ensure a peculiar interpenetration of different methods [Zhurin, 2005, p.37]. Preference is given to the synthesis of theoretical and practical assignments: information search and systematization, information conversion from visual into verbal forms and vice versa; information transformation, information search for errors, media texts review, information search for the message, ICT literacy, etc.

13. Media education program contents (based on the key concepts of media education: *media agency, media category, media technology, media language, media representation, media audience*):

- media education assignments integrated into compulsory primary school subjects;
- media education assignments integrated into compulsory subjects of the general secondary school.

As a result, according to the media education standard offered by L. Zaznobina, school leavers are supposed to be able:

- to understand tasks in different wordings and contexts;
- to find the required information in different sources;
- to systematize the offered information or the self-obtained information on the given characteristics;
- to collect and systematize subject information during a long period of time (term, school year or any other time cell);
- to convert visual information into verbal system;
- to transform information, modify its content, form, sign system, data carrier and so on, depending on the communication purpose and the intended audience;
- to apprehend communication purposes, directivity of the information flow;
- to give argumented opinions;
- to find errors in the obtained information and correct it;
- to tolerate alternative view points and to give sound arguments (for and against the opinion);
- to review and announce media texts;
- to ascertain associative and practically expedient relations between media texts/messages;
- to distinguish the message in the media text and to dejoin it from "white noise";
- to make an outline of the media text, to suggest the form of its presentation in accordance with its contents;
- to extract data from the offered information and to present them list-form or in any other form;
- to operate (even on the primitive level) these tools of data preparation, transmission and accessing [Zaznobina, 1996, pp. 75-76; Zaznobina, 1998].

14. **Application fields:** secondary education institutions. The following objectives of media education (integrated into humanitarian subjects and natural sciences of the school curriculum) are emphasized: educational information on this or that field of knowledge

(irrespective of the information source or carrier); information transmitted through different communication channels available to school students; ICT of information creation, transformation, reservation, transmission and operation [Zaznobina, 1996, pp. 74-75].

1. Name of the Media Education Centre: Moscow City Experimental Platform "Media Education Technologies and New Teaching Forms in the Modern Educational Institution" of the Experimental Research Coordination Lab in the General Secondary Education Centre of the Contents and Teaching Methods Institute (Russian Academy of Education) (http://art.ioso.ru).

2. Year of establishment, location: 2001, Moscow.

3. Financing sources: state, municipal funding, grants.

4. Direction: Dr. Svetlana Gudilina.

Svetlana Gudilina: Brief Biography

Head of the Experimental Research Coordination Lab in the General Secondary Education Centre of the Contents and Teaching Methods Institute (Russian Academy of Education), Ph.D., member of the Russian Association for Film & Media Education. Svetlana Gudilina is the research supervisor of the Moscow city experimental platform "Media Education Technologies and New Teaching Forms in the Modern Educational Institution". She teaches a university course 'Using ICT in Education' in Moscow State Pedagogical University.

Svetlana Gudilina has a number of publications (including teachers' guides, programs) on the problems of integrated media education, media education and arts in school. Frequently took part in scientific conferences. Designer of the web-site: http://www.art.ioso.ru, http://www.art.ioso.ru, http://edu.of.ru/mediaeducation, http://edu.of.ru/medialibrary

5. Target Audience: school students of different age-groups, students, teachers, kindergartens' educators (basic platforms: School № 858, School № 1173, Kindergarten № 2435, innovation web: Schools №№ 511, 515, 574, and 1405).

6. Chief aim: to train pupils, students, teachers to sensibly interact with audio-visual media texts as well as with printed texts, to develop communicative and analytical skills working with different text forms, to form creativity through positive media within media education integrated into compulsory school subjects and in the process of self-education as well.

7. Objectives:

- research and analysis of media education experience;
- holding of conferences and workshops (including remote videoconferences) on media education problems;
- creating media education courses for school students, pedagogical university students, teachers, kindergartens' educators;
- helping students to obtain actual independence of mass media manipulations;
- making students active participants of communication in the modern society as well as in the future society;
- developing students' media competency, i.e. their abilities to expert information search and interpretation; abilities to analyze, critically interpret and create media texts; use media for self-education, in creative projects and intellectual potential enhancement.

8. Working definition of media education: the definition given in the UNESCO papers.

9. Key media education theories: practical theory, theory of developing critical thinking, and semiotic theory of media education.

10. Media education model units: administrative, cultural, teaching and methodical, educational and scientific components.

***11.* Organizational forms:**

- city, regional seminars run by teachers-experimentalists; workshops on media education for educators and school administration with the framework of teachers' extension program;
- Internet-seminars for pupils and teachers;
- annual scientific practical conference 'Educational Technologies of the 21st Century';
- annual school students' teleconference 'World's Culture in the Internet';
- regional educational project 'Media Festival';
- teachers-experimentalists' participation in the system 'President's Prize', 'Moscow Grant';
- creation of Media Education Technologies Bank;
- master-classes including media education elements, discussions of video recorded lessons

for the channel 'Stolitsa Plus';

- master-classes at All-Russian Exhibition Centre;
- realization of the program for pedagogical university students 'ICT in Teaching';
- experimental site support: http://art.ioso.ru.

For instance, there were organized seminars on different topics for primary school: *Media Education Technologies in Primary School, Audio/Video Recording in Primary School, How to Work with Children's Journals,* etc. For general and secondary school the following topics were chosen*: ICT and Media Education, Media Education Integrated into Compulsory Education, Teaching with Media* (chats, Internet-seminars, teleconferences, presentations, round work tables, etc.)*, Didactic and Teaching Requirements to Smart Board Usage, Cinema Art Through Creation, Using Internet Resources in the Classroom, How to Become a Journalist, Educational Environment of School and Mediatheque, The Principle of Visualization in Media Education Technologies, Development of Media Education Competences.* For pre-school institutions: *Media Education in the Kindergarten, Information and Communication Environment in the Media Educational Aspect, Development of Communicative Skills in the Media Educational Aspect, Game in the Media Educational Aspect* and others [Gudilina, 2009 http://art.ioso.ru/index.php].

12. **Teaching methods:**

According to the knowledge sources: *verbal methods, visual methods, practical methods;* according to the level of cognitive activity: *explanatory and illustrative* methods, *reproductive methods*, *problem-solving methods*, *heuristic, research methods.* Preference is given to research methods and the methods developing the audience's critical thinking (reflective methods of assessment, comparison and identification of information and media texts), practical methods (ICT literacy development which helps to understand mass media messages and objectives from inside).

13. Media education program contents: (deals with the key concepts of media education: *media agency, media category, media technology, media language, media representation, media audience*):

- School № 511: *Communicative Competency Development in the Aspect of Media Education*;
- School № 515: *The Role of ICT and Mass Media in the Media Educational and Communicative Competence of School Students;*
- School № 574: *The Realization of the Socialization Principle in Educating with Media Technologies;*
- School № 858: *Media Education Integration into Basic School Subjects;*
- School № 1173: *Modern Means of Education in the System of Media Education and Communicative Didactics* (Primary School) and *Media Education and Internet Technologies Integration for the Development of School Students' Communicative Competence;*
- School № 1405 (*Inspiration*): *The Role of Media Education in Teaching the Arts* [Gudilina, 2007, p. 11].

So, each school involved in the experiment works on a definite theme of the general program of the media education centre.

In the city kindergarten № 2435 another experiment is being carried out on the topic: *The Development of Communicative Culture in the Media Educational Aspect in the Preschool Institution.*

14. Application fields: schools, kindergartens, universities.

After several years of the experimental work in schools the experiment organizers raised a question: *What has changed in your school since the media education experiment was started?* 62 teachers and local education authority officials took part in the questionnaire. The majority of the interviewees noted the positive changes in teaching methods, intellectual and scientific growth of school teachers; in understanding how to organize students' media education, the work with e-books, etc. [Gudilina, 2009 http://art.ioso.ru/index.php].

1. Name of the Media Education Centre: Faculty of Journalism, Moscow State University (http://www.journ.msu.ru).

2. Year of establishment, location: the Faculty of Journalism (MSU) has been training media specialists since the date of its opening (1947, Moscow) but it took up mass media education only in 2009 when the direction of the faculty won a UNESCO Bureau grant in Moscow for arranging media education courses for Moscow school teachers; they presented their project for the

discussion in the Moscow City Parlament which was approved of in May, 2009 and recommended the introduction of media education courses in the city in Moscow schools.

3. Financing sources: state funding, grants.

4. Direction: Prof. Dr. Elena Vartanova.

Elena Vartanova (born December 28, 1959): Brief Biography

Doctor of Philology (1999), Professor, dean of the Faculty of Journalism (MSU) Elena Vartanova graduated from the Faculty of Journalism (MSU) (1981). She is a member of the *European Media Management Education Association*, ECCR (The European Consortium for Communication Research), IAMCR (International Association for Media and Communication Research) and the Russian Association for Film & Media Education, director of the Finnish-Russian Research Centre of journalism, mass communications and culture, editor of the Russian journals *Media@almanach* and *Meida@scop*. In 1995-2000 she was an expert of the Council of Europe. She is a laureate of scientific grants of a number of international funds and the Russian Humanitarian Scientific Fund (2006-2008). Has more than 100 articles published in Russian and foreign academic journals. Presently she researches modern media economics in the information society, supervises a media education project supported by a UNESCO Bureau grant in Moscow. She reads lectures on media economics, history of business journalism, foreign mass media.

Bibliography **(Elena Vartanova's books in Russian):**

Vartanova, E. (1997). *The Northern Model at the End of the Century. Press, TV and Radio of Northern Europe Countries between State and Market Regulation*. Moscow.

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Vartanova, E. (2006). *Encyclopedia of the World Media Industry*. Moscow.

Vartanova, E. (2009). *The Theory of Mass Media*. Moscow.

http://www.journ.msu.ru

5. Target Audience: students of the journalism faculty, media specialists, teachers, school students.

6. Chief aim: developing the audience's creative and critical attitude to mass media, the audience's transformation into a lifelong creative media user [Vartanova, Zasursky, 2003, p. 5].

7. Objectives:

- holding of conferences and workshops on media education problems;

- creating programs of media education courses for school / university students, and teachers;

- familiarizing the audience with the key concepts and laws of the communication theory, developing initial operational skills of media work;

- developing the audience's comprehension of media and media texts, of conscious contact with the media;

- developing media creation.

8. Working definition of media education: "Media education = protection against the media + preparation for media analysis + comprehension of media functions + conscious participation in media culture" [Vartanova, Zasursky, 2003, p. 6].

9. Key media education theories: elements of the theory of developing critical thinking, sociocultural theory, semiotic theory, cultural studies theory, practical and protectionist theories of media education.

10. Media education model units: administrative, educational and teaching, and scientific units.

11. Organizational forms: different media education courses depending on the education institution (university, school) which take into account the interconnection of different modules/stages in the education system.

12. Teaching methods: according to the knowledge sources: *verbal methods, visual methods, practical methods;* according to the level of cognitive activity: *explanatory and illustrative* methods, *reproductive methods*, *problem-solving methods*, *heuristic, research methods*. There dominate theoretical and practical blocks including creative assignments, role play of different types.

13. Media education program contents (deals with the key concepts of media education: *media agency, media category, media technology, media language, media*

representation, media audience):

- media categories;
- mass communication (the concept of mass communication , media language, etc.);
- media technologies;
- media reflection of reality;
- Internet as mass media [Vartanova, Zasursky, 2003, p. 9-10].

Besides they offered some rough media education programs: 1) knowledge of mass media and developing initial media user's skills; 2) developing media comprehension and constant media user's skills training; 3) conscious media participation; 4) media creation development (including the ability to create media texts) [Vartanova, Zasursky, 2003, p.7-8], and a series of media education programs for school students (2009-2010) of an apparently practical character. In the authors' opinion they can be grouped or altered depending on the target audience.

14. Application fields: the media education courses can be used in institutions of different types for: 1) continuous education, 2) school education; 3) higher education, 4) disadvantaged groups education, 5) teachers' training [Vartanova, Zasursky, 2003, p. 7].

1. Name of the Media Education Centre: public organization – League of Young Journalists of Russia (YUNPRESS) (http://www.ynpress.com, http://www.mediashkola.ru)

2. Year of establishment, location: 1996, Moscow.

3. Financing sources: private financing, grants.

4. Direction: Dr. Sergey Tsymbalenko.

Sergey Tsymbalenko (born October 14, 1949): Brief Biography

President of the regional public organization – YUNPRESS, executive director of the League of Young Journalists of Russia, Ph.D., Sergey Tsymbalenko graduated from the Philosophy Faculty of the Urals State University; worked as a staff correspondent of the newspaper *Pionerskaya Pravda* in the Urals, an instructor of the Central Council for the pioneers' organization. In 1992 was one of the founders of the first in the country children's information/news agency YUNPRESS.

***Bibliography* (*Sergey Tsymbalenko's books in Ruyssian*):**

Tsymbalenko, S., Sharikov, A., Scheglova, S. (1999). *Russian Teenagers in the Information World (Sociology Surveys)*. Moscow: Yunpress.

Tsymbalenko, S., Sharikov, A., Scheglova, S. (2006). *The Information Environment of the Russian Teenager in the Post-Soviet Period (Sociological Analysis)*. Moscow: Research Institute of School Technologies. 128 p.

http://www.ynpress.com

http://www.mediashkola.ru

5. Target Audience: school students.

6. Chief aim: developing school students' media activity (generally on the press material).

7. Objectives:

- teaching the basics of media culture to school students;
- developing school students' media creation (generally on the press material);
- organizing different festivals and competitions of school press;
- sociological research on the topic 'Children and Media'.

8. Working definition of media education: the definition given in the UNESCO papers.

9. Key media education theories: the theory of media activity resembling the practical theory of media education.

10. Media education model units: objective block (school students' involvement in media text creation), 'media activity' block (collaboration of media specialists, teachers and students aimed primarily at developing school press), result block (forming a net of school editions meant for the audience of different ages).

11. Organizational forms:

- media production (e.g. children and teenage press, Internet sites);
- educational programs (courses, seminars, master classes, workshops) on media education on the press material;
- holding of media festivals, competitions;
- publishing books on media education of school students on the press material.

12. Teaching methods - according to the knowledge sources: *verbal methods, visual methods, practical methods;* according to the level of cognitive activity: *explanatory and*

illustrative methods, *reproductive methods*, *problem-solving methods*, *heuristic, research methods*. But practical methods dominate.

13. Media education program contents (deals with the key concepts of media education: *media agency, media category, media technology, media language, media representation, media audience*): mass communication, media technologies; developing school students' media creation.

14. Application fields: in educational institutions of different types, culture centers, media agencies.

Conclusions. My analysis has shown that the majority of media education centers tend to the synthesis of theoretical concepts and pay with every year more attention to practical methods of media education. It is characteristic of the media education conceptions of E. Bondarenko, S. Gudilina, L. Zaznobina, E. Vartanova and Y. zasursky, S. Tsymbalenko and other Russian media educationalists.

At the same time, the synthesis of the aesthetic and sociocultural media education models suggested by Y. Usov [Usov, 1989, 1998], for example, is now supported by such Russian media educationalists as L. Bazhenova.

Thereby, Moscow media education centers have developed a number of perspective media education models used in education of people of different social strata, especially – of school students and young people.

The analysis of the basic media education models used in Moscow media education centers has shown that nowadays the synthetic media education models are most typical; they are based on the synthesis of the sociocultural, educational and informational, practical and utilitarian models. And they lean towards the maximum usage of media education potential depending on the aims and objectives; they are characterized by variability, and the capacity to entirely or partially integrate into the education process.

The suggested media education technology is based as a rule on blocks or modules of creative and role play/gaming assignments for the teachers to use both in school and out-of-school activities. An important peculiarity of the analyzed models is that they have a wide field of application: schools, universities, institutions of additional education and leisure activity. Media studies may be organized in the form of lessons, optional classes, and special courses integrated into different school subjects, or used in school societies.

And here one should consider S. Pensin's opinion who justly warns against such typical mistakes unfortunately characteristic of some media education models: vulgar sociologism, imposition of ready stereotyped schemes, retreat from ethical problems of media texts [Pensin, 1987, p. 64].

Taking into consideration the above-examined models one can build a rough model of developing a person's media competence depending not only on the general didactic principles of education (upbringing and all-round personality development, scientific character, intelligibility, systematic character, unity of theory and practice, visualization, life-long learning, practical value, sound knowledge, positive emotional background, consideration of students' individual peculiarities, etc.) but also on some specific principles connected with media content.

Among such principles one can mention the observance of unity of the emotional and intellectual aspects in the personality development, creative abilities, and individual thinking in teaching targeted at the maximum usage of media culture potential, and based on using hedonistic, compensatory, therapeutic, cognitive and heuristic, creative and gaming potential of media texts enabling the teacher to involve the audience both in perceptive and interpretive activity; analysis of space-and-time, audio-visual media text structure, and also in media creation (creating one's own media texts of different types and genres). Plus correlation with the current media situation which alongside with its shortcomings (stranglehold of low-grade mass media production, etc.) offers teachers the challenge connected primarily with using video recording, computers, Internet, interactive media potentialities.

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Центры медиаобразования в Москве, не ориентированные на подготовку медиайных профессионалов

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Аннотация. Анализ основных образовательных моделей, используемых в московских медиаобразовательных центрах показал, что в настоящее время синтетические модели медиаобразования наиболее типичны, данные модели основаны на синтез социокультурных, образовательных и информационных, практических и утилитарных моделей. Для них характерно максимальное использование медиаобразовательного потенциала в зависимости от целей и задач; они характеризуются изменчивостью и способностью полностью или частично интегрировать в образовательный процесс. Медиаобразовательные технологии основаны, как правило, на блоках или модулях, творческих и ролевых играх. Важной особенностью анализируемых моделей является то, что они имеют широкую область применения: в школах, университетах, учреждениях дополнительного образования и досуга. Медиаобразование может быть организовано в виде уроков, факультативов, спецкурсов и интегрировано в различные школьные предметы.

Ключевые слова: Россия; Москва; медиаобразование; центр; медиаграмотность; школа; вуз.

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An Analysis of Classroom Management Approaches of Teachers: The Case of Turkey

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Abstract. In this study conducted to analyse the classroom management approaches of the teachers a total of 505 teachers working in public and private schools participated voluntarily.In this research in which the relationship of the teachers' classroom management perceptions with various variables is questioned, "The Classroom Management Styles of Teachers Scale" was used as data collection tool. As a result of the reliability analysis done through the data obtained in this study, Cronbach's Alpha coefficient of this 5-point likert scale which consists of 34 items and 3 factors as autocratic classroom management, democratic classroom management and disinterested classroom management was found 0.82.The data obtained from this study were analysed in SPSS 15.0 for Windows Package program. Firstly, One Sample Kolmogorov-Smirnov test was applied to see whether the data follow normal distribution or not. Non-parametric tests were used as the data did not demonstrate normal distribution. Mann-Whitney and Kruskal-Wallis H tests were applied to compare the data with respect to variables.To determine the relationship between sub-dimensions, Spearman correlation analysis was used. As a result of the study, it has been identified that attitude of democratic management was affected by many factors while the attitude of autocratic and disinterested classroom management were affected by a small number of factors. This study specifying which form of management is used predominately by whom, will help teachers choose the classroom management style which suits them most.

Keywords: classroom management; classroom management perceptions of the teachers; teacher efficacy.

Introduction

Classroom environment is an essential area where events occur related to education and training. Students have most of their times in classrooms throughout their education life. During this period, both teachers and students participate in classroom life in accordance with a specific purpose and program. It is the responsibility of the teacher to maintain appropriately the predetermined objectives in the classroom. In other words, regulation and management of the learning environment in the classroom is under the control of the teacher [1].

Examination of different aspects of classroom management emerges as an important issue in educational psychology for many years [2, 3, 4, 5]. Factors such as preparation of classroom environment that is conducive to learning, arranging physical conditions that facilitate learning format, controlling teaching stream, making use of the time well, organizing and managing in-class relations, providing social interaction and generating student motivation constitute teachers'

classroom management skills [6, 7]. Teachers' classroom management attitudes and approaches are defined as styles of classroom management [8]. In addition, managing the negative behaviours exhibited by the students is assessed within the classroom management [9]. Because when the teachers face with unwanted situations they should intervene appropriately to those behaviours in the context of classroom management [10]. Teachers should learn different teaching methods and techniques communicate with colleagues and seek solutions by getting professional help to overcome the problems they encounter in the classroom environment [11].

There are three important elements of classroom management. These are; defining the rules clearly which students must obey, exhibiting a positive approach to students about the rules and determining the probable outcome that the students will face who do not obey the rules [12]. Classroom manner and management strategies used by the teachers affect both motivation and academic success levels of the students in terms of their schools and courses [13, 14]. University education is the first place where the teachers' knowledge and skills level related to classroom management is developed. Before starting professional life, teachers learn in their department such basic subjects as recognition of students in classroom management courses, preparing appropriate teaching-learning process for the students, providing class domination and giving shape to learning [15]. And when they start to their professional career, teacher behaviour will have an important role in classroom management. In the classrooms where the teachers exhibit negative behaviour, classroom climate which the students perceive will be on the decline. Positive climate in the classroom environment is an element that increases students' academic achievement. In other words, we can say that class climate emerging depending on the classroom management styles is an important factor affecting students' academic achievement [16]. There fore, today developing classroom management skills of the teachers emerges as an important issue about teachers' being more efficient who has responsibility of training qualified manpower. Besides, there are some principles in classroom management. These are the principles which the teachers should know and apply in the classroom. Through classroom management principles, students can be knowledgeable and successful by keeping pace with the constantly changing and evolving world [17].

Teachers have some classroom management styles in the classroom environment. These management styles are basically divided into two as democratic and authoritarian (autocratic) manners. Teachers can apply any of these behaviours or both simultaneously. Teachers' classroom management style which they will use varies in terms of their teaching process, teaching environment, experience and social interaction of them [18].Education which the individuals receive is of great importance in the culture of democracy in the society to become established. Hence, students' gaining democratic behaviour is possible through the democratic behaviour of teachers in classroom management. In the studies conducted on this subject, in teacher education programs for teachers have emphasized the need to gain democratic behaviour [19, 20, 21, 22].

Teachers' exhibiting authoritarian behaviours in the classroom is connected to the classroom environment as well as it is shaped by the personality and character traits of them. Besides, the precondition of authority in the classroom is a good teaching. Because in the classroom where the teaching environment is poor teacher's authoritarian approach will not give result, consequently dynamism of the class will be disrupted and unwanted behaviours will occur in the classroom. Inauthoritarian classroom management, teachers impose permanent limitations and control over the students.

In addition to democratic and authoritarian classroom management styles, other management used by teachers is disinterested management. In disinterested classroom management teachers' demand from students is very low. Teachers' behaviour intended to control students is at the low level. Teachers, who prefer disinterested classroom management, accept students' reaction and behaviours and they are contented with just watching them. Nowadays, determining the approaches of the teachers related to classroom management styles is an important case for the new teachers to be successful in their classroom management practices. In addition, new studies are needed for teachers to demonstrate more positive approaches to classroom management. In this context, in this research it is aimed to analyse classroom management styles of the teachers in different branches in terms of some variables.

Materials and Methods

Research Design

This research has been conducted on the basis of General survey model because it aims to describe the current situation as it is, regarding the teachers' classroom management approach [23].

Sample

A total of 505 teachers working in public and private schools in Isparta, Turkey in the 2014 school year participated in this study voluntarily. Descriptive data about the participants are given in Table 1.

Table 1. Descriptive statistics related to participants

Variables	Sub-dimensions	f	%
Gender	Male	281	56.2
	Female	219	43.8
Professional seniority	1-5 Years	53	10.6
	6-10 Years	103	20.6
	11-15 Years	147	29.3
	15+	198	39.5
Types of the faculties they graduated	Faculty of Science and Letters	83	18.2
	Faculty of Education	328	71.8
	Other Faculties	46	10.1
Types of the schools they work	Private	46	9.1
	Public	459	90.9
Socio-economic status of the schools	Low	72	15.6
	Average	281	61.0
	High	108	23.4

Research Instruments

The two-part questionnaire was usedas a means of data collection in research to determine the teachers' classroom management approach. The first part of the form prepared by the researchers includes personal information form. In the second part, “The Classroom Management Styles of Teachers Scale” takes part. The scale developed by Terzi in 2001 consists of 3 sub-dimensions as autocratic classroom management, democratic classroom management and disinterested classroom management [24]. As a result of the reliability analysis done through the data obtained in this study, Cronbach's Alpha coefficient of this 5-point likert scale which consists of 34 items and 3 factors as autocratic classroom management, democratic classroom management and disinterested classroom management was found 0.82. This value indicates that the scale is highly reliable [25]. Number of items relating to the sub-dimensions of the scale, the highest-the lowest scores obtained from the sub-dimensions and the mean scores of the sub-dimensions obtained from this study are all located in Table 2.

Table 2. Information related to sub-dimensions of the scale

Information related to sub-dimensions	Sub-dimensions of the scale		
	Autocratic classroom management	Democratic classroom management	Disinterested classroom management
Number of items	11	11	10
The lowest score that can be taken from the sub-dimension	11	11	10

The highest score that can be taken from the sub-dimension	55	55	50
The mean scores of the sub-dimensions (X±SD)	34.3±6.9	42.1±8.6	27.0±6.6

Data Analyses

The data obtained from this study were analysed in SPSS 15.0 for Windows Package program. Firstly, One Sample Kolmogorov-Smirnov test was applied to see whether the data follow normal distribution or not. Non-parametric tests were used as the data did not demonstrate normal distribution. Mann-Whitney and Kruskal-Wallis H tests were applied to compare the data with respect to variables. Mann Whitney U test was used to make comparison in terms of gender and type of school while Kruskal-Wallis H test was employed to compare professional seniority, types of the faculties they graduated, socio-economic status of the school they work, relationships with colleagues, relationships with students, attitude of the managers and parent-teacher relations. Mann-Whitney U test was used as post hoc analysis to determine which group causes differences in the case of the differences between the groups as a result of Kruskal-Wallis H test. To indicate the relationship between sub-dimensions, Spearman correlation analysis was used.

Findings and Results

Table 3. Comparison of teachers' classroom management perceptions in terms of demographic variables

Variables	Sub-dimensions	Autocratic management	Democratic management	Disinterested management	Significance Level		
					Autocratic	Democratic	Disinterested
		X±SS	X±SS	X±SS			
Gender	Male (n=281)	33.5±6,3	41.9±8.2	27.0±6.0	Z= -2.632 P= .008	Z= -1.227 P= .220	Z= -.962 P= .336
	Female (n=219)	35.1±7.5	42.4±9.1	26.9±7.2			
Professional Seniority	1-5 years (n=53)	32.9±7.5	40.6±8.7	27.0±7.3	X^2= 7.806 P= .050	X^2= 22.687 P= .000	X^2= 4.797 P= .187
	6-10 years (n=103)	35.9±7.7	38.7±9.9	28.4±7.2			
	11-15 years (n=147)	34.9±6.8	42.6±8.1	26.8±6.6			
	15+ years (n=198)	33.4±6.2	44.1±7.7	26.4±6.0			
Types of the they faculties graduated	Science and Letter	34.4±7.3	42.5±8.6	26.4±6.4	X^2= 1.700 P= .427	X^2= 1.920 P= .383	X^2= 1.128 P= .569
	Education (n=328)	34.5±7.0	41.6±8.8	27.1±6.7			
	Other faculty (n=46)	33.3±5.9	43.5±7.9	27.1±6.3			
School Type	Private n=46)	32.5±4.6	44.8±7.2	23.4±5.3	Z= -1.607 P= .108	Z= -2.247 P= .025	Z= -4.101 P= .000
	Public (n=459)	34.4±7.1	41.8±8.7	27.3±6.6			

Socio-economic status of the schools	Low (n=72)	34.7±6.9	43.6±8.2	27.7±6.3	X^2=.257 P= .879	X^2= 10.579 P= .005	X^2= 1.565 P= .457
	Average (n=281)	34.1±6.3	41.8±8.2	26.7±6.2			
	High (n=108)	34.4±7.9	44.3±8.5	27.1±7.8			
Relationships with colleagues	Normal (n=110)	33,3±5,8	40,2±9,2	26,9±5,1	X^2= 6.832 P= .033	X^2= 6.447 P= .040	X^2= 1.756 P= .416
	Good (n=240)	35.3±7.0	42.8±7.8	27.2±6.9			
	Very good (n=152)	33.5±7.3	42.5±9.1	26.6±7.1			
Relationships with students	Normal (n=66)	33.4±4.8	39.1±8.1	26.6±4.9	X^2=.060 P= .971	X^2= 12.058 P= .002	X^2= 5.810 P= .055
	Good (n=254)	34.3±6.5	42.4±8.3	26.1±6.0			
	Very good (n=184)	34.5±8.1	42.9±9.0	28.2±7.6			
Attitude of the managers	Normal (n=177)	33.4±6.3	41.4±8.9	26.0±5.7	X^2= 5.76 P=.075	X^2= 1.771 P= .413	X^2= 3.776 P= .151
	Good (n=205)	35.3±7.3	42.5±8.3	27.7±7.0			
	Very good (n=119)	33.8±7.0	42.7±8.8	27.0±7.0			
Parent-Teacher relations	Normal (n=125)	34.1±6.4	40.6±8.5	27.5±6.0	X^2= 1.26 P= .530	X^2= 12.68 P= .002	X^2= 6.863 P= .032
	Good (n=258)	34.7±6.8	43.6±7.4	26.3±6.6			
	Very good (n=122)	34.3±6.9	42.1±8.6	27.0±6.6			

Z=Mann Whitney U test; X^2=Kruskal Wallis H test; P=Significance Level

When the table is analysed; a significant difference ($p<0.05$)is observed between gender and relationships with colleagues in autocratic management mean scores. Female participants and the ones who get on well with their colleagues have significantly higher mean scores than others have. There is a significant difference between the democratic management mean scores and professional seniority, types of school, socio-economic status of the schools, relationships with the colleagues, relationships with students and parent-teacher relationships ($p<0.05$). In disinterested management it is observed that types of school and parent-teacher relationships are significantly different ($p<0.05$). Those teachers who work in private schools and the ones who have good relationships with parents have the lowest score of disinterested management.There is no significant difference between the type of faculty they graduated and any of the sub-dimensions ($p>0.05$).

According to the results related to the autocratic management scores; it is concluded that there is a significant difference between the mean scores of the teachers who have relationships with their colleagues at normal level and the ones who have good relationships with them.

According to the results related to the democratic management scores;Significant difference is observed among those with 1-5 years of professional seniority and the ones with +15 years of it, those who have 6-10 years of professional seniority and the ones with 11-15 years and 15+ years of it($p<0.05$). Between the mean scores of the teachers who work at the schools with average socio-economic status and those working at schools with high-level status are significantly different ($p<0.05$). There is a significant difference between the mean scores of the teachers who have relationships with their colleagues at normal level and the ones who have good and very good relationships with them ($p<0.05$). It is observed that there is a significant difference

between the mean scores of the teachers who have relationships with students at normal level and the ones who have good and very good relationships with them (p<0.05). In addition, there is a significant difference between the mean scores of the teachers with normal level relationships with parents and the ones who have good and very good relationships with them (p<0.05).

According to the results related to the disinterested management scores; It has been found a significant difference between the mean scores of the teachers with good relationships with parents and the ones who have normal and very good relationships with them (p<0.05).

Tablo 4. Examining the relationship of teacher efficacy scale sub-dimensions between each other

	Correlation	**Democratic**	**Disinterested**
Autocratic	r	.058	.312
	p	.190	.000
Democratic	r		-.221
	p		.000

While increase in autocratic management scores has led to a significant decrease in disinterested management scores (p<0.05), increase in democratic management scores causes significant decrease in scores of disinterested management (p<0.05). There is no significant difference between democratic and autocratic management (p>0.05).

Discussion

In our study, we have identified that autocratic classroom management approach is preferred more by female teachers than male teachers, and by the teachers who get on well with their colleagues than the ones who do not. It is known that female teachers' general perceptions of classroom management are higher than male teachers. On the other hand, in some conducted researches it is specified that male teachers exhibit more autocratic management manner than female do, and in some studies it is established that teachers' classroom management manner does not differ according to gender [26, 27, 28, 29]. On the basis of the authoritarian approach by teachers in classroom management such reasons as showing their status, getting the children to gain the ability to learn successfully, providing administrative control over the class underlie. The teachers' use of the status they have by taking into account the current status of them indicates thatthey possess this authority. The teachers exhibiting authoritarian approach by using their status show theirauthorities to the students dominatingly [30]. Today, in the transition from traditional society to modern society women's choosing teaching profession who express themselves better and have improved self-confidence, and their finding themselves more sufficient than men in career life can be the main reason for them to exhibit more authoritarian attitude in classroom management than men do [31].

In this study it has been found that teachers' democratic approach level in classroom management varies according to their professional seniority. According to the results of the analysis obtained, it has been identified that while the teachers' level of professional seniority increases their level of exhibiting democratic attitude in classroom management increases as well. This result, that is, increase in the teacher's experience they gain related to their professional seniority and as a result of this, it may be associated with the mature, democratic and empathetic attitude they exhibit. Hence, it has been specified that in similar conducted studies, while the professional seniority of the teachers increases they exhibit more democratic approach on ensuring discipline in the classroom. The main reason of this result is that beginning teachers have more democratic classroom management perceptions who fail in fulfilling the classroom activities and solving in-class problems due to the lack of experience. In addition, it has been identified that semi-experienced teachers exhibit more authoritarian approach to negative student behaviours compared to those having high level of professional seniority [32]. This idea is quite realistic approach. It is a known fact that in the early years of their professional life, the newly appointed teachers have difficulties in many aspects as adaptation to school, classroom management,fulfilling teaching task and using the teaching materials effectively [33, 34]. Besides, teachers' in-class relationship with their students is a very important issue for teachers to exhibit healthy

management in the classroom. It is known that with high professional seniority experienced teachers communicate with their students more effectively than teachers with low levels of teaching experience.However, in some conducted studies it has been concluded that as the teachers' professional seniority increases they employ disinterested classroom management more [35, 36]. As teacher's years of seniority increases their level of professional burnout rise as well and consequently professional desensitization can be considered as the main factor of this [37]. Those research results indicating that teachers' professional seniority and level of experience do not affect classroom management approach also take part in the literature [38].

In our study it has been found that socio-economic status of the schools affect the level of democratic attitude exhibited by the teachers. According to the analysis results it has been identified that the most democratic attitudes in classroom management are exhibited by the teachers working in schools with high levels of socio-economic status. Socio-economic status of the school is an important factor affecting the perceptions and attitudes of the teachers in classroom management [39]. In similar studies in the literature, it has been pointed out that as the socio-economic status level of the schools increases democratic attitude by teachers rise as well whereas it has been specified that the rate of authoritarian management applied by them decreases. In schools with high levels of socio-economic status, teachers' going to work more eagerly and planning the courses much better are shown as the main reason for this [40]. According to these findings we can say that socio-economic development level of the schools need to be enhanced to ensure democratic classroom management.

Significant difference is found among the teachers who have relationships with their colleagues at normal level and the ones who have good relationships with them and their democratic management levels in classroom management. According to the results obtained from the analysis, teachers exhibit more democratic attitude in classroom management when their relationships with their colleagues are at higher levels. Being in contact with other teachers is very important to gain different perspectives in solving problems teachers face with. In this context, communication among teachers has great importance both in classroom management and development of democratic management approach to minimize the problems they encounter.

It is an important finding of this research that managers' positive attitudes towards teachers lead to increase in democratic classroom management. Teachers' relationship with school managers is a key element affecting classroom management indirectly [41]. The positive relationship between the school management and teachers enhance organizational commitment of teachers and contribute more comfortable atmosphere for them to fulfil their profession. There occurs an increase in the level of democratic attitude by teachers who have comfortable working environment in schools and classrooms.

In our study it has been found that teachers having good relationships with their students exhibit more democratic attitude than other teachers. Likewise, teachers having good and very good relationships with parents exhibit more democratic attitude in classroomthan those having relationships at normal level. Teachers' sensitivity to classroom management relationship environment in the classroom environment affects learning process positively [42]. In addition, in the classrooms where the teachers are successful in communicating with their students, the sense of self-esteem develops. As a consequence of that it enables students to develop positive attitudes towards school and participate inclass activities. Therefore, teacher-student communication is an important element in the learning environment [43, 44, 45]. As completely teacher-centred management approach in the classroom environment makes students get bored of the courses and causes the deterioration of the learning environment, exhibiting democratic and participatory management is useful for healthy classroom management [46].

In this study it has been identified that type of the school and teacher-parent relationships affect the level of exhibiting disinterested management attitude. According to the results of the analysis obtained, it has been found that teachers working in private schools and the teachers having good relationships with parents exhibit more disinterested management attitude than others. In addition, it has been observed that teachers in private schools have more democratic management attitude. Alongside a qualified teacher and suitable classroom environment, cooperation among school, students and parents should be at high level. In addition, the communication between teachers and parents is an important factor that directly affects classroom management [47].In public schools, there is more authoritarian management bureaucratic and

administrative aspects compared to private schools. This case can be considered as a factor which increases the level of disinterested management manner in private schools.

There is no significant difference between the type of faculty they graduated and the scores of autocratic, democratic and disinterested management. This result has its sources from the fact that faculties from which teachers graduated have the similar course contents. Studies need to be conducted on the teachers who graduated from private and state universities to examine the effects of those universities on the classroom management approach of the teachers.Because, the concept of education in these institutions are different from each other.

In this research, it has been established that while autocratic management attitude enhance the disinterested management attitude, democratic management attitude causes a decrease in disinterested management attitude.Authority is an essential characteristic that teachers always carry with them and it is accepted as one of the ways of ensuring discipline in the classroom. Referring in this context, increase in autocratic management style is expected to reduce the disinterested management approach however this study has found directly opposite result. Students' exhibiting less undisciplined behaviours in the classroom and higher attitude towards courses can be considered as the main reason of disinterested management approach of the authoritarian teachers participated in our study.

Conclusions

As a result, it has been clearly identified that female teachers show more authoritarian manner than male, increase in professional seniority level of teachers leads to increase in democratic management attitude as well, increase in socio-economic level of the schools contributes to more democratic attitude, teachers in private schools exhibit more disinterested classroom management style than those working in public schools. Besides, it has been established that democratic, authoritarian and disinterested management styles vary across student-teacher, teacher-parent and teacher-school relationships. Because the behaviours of teachers is a factor that directly affects the learning environment and academic success, developing teachers' attitudes related to classroom management have great significance. In this context, required precautions should be taken to identifying deficiencies of teachers in classroom management, evaluating current attitudes related to classroom management and ensuring the classroom management more effective.

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Exploration and Exploitation of Mineral Waters and their Influence on the Regional Development – Case Study of a Vrnjacka Spa (Serbia)

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Abstract. Geothermal energy, coal and hydropower are the major resources of Serbia. Serbia has more than 300 mineral and thermo mineral wells and more than 40 spas. Vrnjacka Spa is the most visited spa in Serbia. It is situated in the central Serbia, on the contact of the Goc Mountain and the West Morava valley, e.g. on the 43°37′ of the northern latitude 20°53′ of the eastern longitude. Using different literature sources, article provides an overview of the past and state of exploration of mineral and thermo mineral waters of Vrnjacka Spa. It explains their importance and influence on the development. The article analyzes the characteristics of thermo–mineral waters in Vrnjacka Spa and the condition and possibilities of their exploitation in different economic branches. Explorations are still contemporary trend in Vrnjacka Spa. There are few new springs. Particular attention is given on the results of questionnaire about future development of Vrnjacka Spa. Results show the following facts. Existence of Vrnjacka Spa and its region depend of wellbeing of mineral and thermo-mineral waters. There are different views of development perspectives. Generally they are differed on the positive and optimist views of young people and other, which belong to elder respondents.

Keywords: thermo-mineral waters; Central Serbia; Vrnjacka Spa.

Introduction

Geothermal energy is considered to be ecologically clean [Duffield, Sass, 2003; Kaygusuz, Kaygusuz, 2004]. It belongs to the group of renewable types of energy [Demirbas, Bakis 2004; Fridleifsson, 1996; 2001]. In exploitation, it is cheaper and multiple profitable in the long run compared to all the energies that have been conventionally used. Unlike the other natural renewable sources of energy, it does not depend upon the season, meteorological conditions and all

the other following influences of the nature. Until the consciousness of its importance and possibility of its exploitation have been risen, geothermal energy was often available to everyone and free [Aswathanarayana, 2010]. Clean drinking water has already become wealth. Besides the ordinary water Serbia is very rich in healing mineral and thermo-mineral waters. There are over 40 spas with therapeutic facilities, having adequate medical equipment, competent medical staff and reasonable accommodation. Some authors claim that there are over 300 locations with thermal and mineral springs although there are no precise data. On the territory of Serbia, the list of registered thermal and mineral waters is not complete. The estimates of the number of spas vary from 45 to 60 taking into consideration so-called 'people's' or 'wild' spas [Romelić, Ćurčić, 2001; Škrbić, 2009]. Mineral and thermo-mineral are, except for drinking, used also for other purposes [Fridleifsson, Freeston 1994; Gupta, Roy, 2007; Hepbasli, Ozgener 2004]. The results of the field research show insufficient use of this renewable energy source in Serbia. The work is focussed on the place in Serbia where this kind of energy, according to criteria of tourist turnover, physiognomy and function of villages, and also products that are based on exploitation of mentioned waters, and origin in it, is the most used. The work presents sources of mineral and thermo-mineral water of Vrnjacka Spa, chronologically, as they were discovered and talks about the ways of their exploitation and about their influence on the development of village. Then, it presents their physical and chemical features with the emphasis on illnesses which are successfully healed, controlled or facilitated by its use. Possibilities of use of this type of energy in future are perceived by consulting the local population through the interview. Special emphasis has been put on its importance in regional survival and development.

Study Area

Vrnjacka Spa is situated in the Central Serbia, on the contact of north slopes of Goc Mountain, which belongs to Kopaonik mountain system, and West Morava valley (Figure). According to geological zoning of the territory of Serbia, which is based on geo-tectonic units, Vrnjacka Spa belongs to Western part of Vardar Zones. Western part of Vardar Zone is composed of several blocks of a diverse composition, rich in ultramafites; then, of Santonian Ophiolitic Melange with metamorphism ranging up to the Cretaceous. This part also includes granitoids and volcanic rocks [Dimitrijević, 1994]. Different mineralogical composition of rocks, ration between non water permeable and water permeable formations, the existence of deep faults and other geological preconditions enabled the existence of significant accumulations of mineral and thermo-mineral waters [Petković, Anđelković, 1976]. Prolonged circulation of infiltration waters through the cracks of Palaeozoic marble in contact with other rocks enabled stronger mineralization and greater heating of ground water. When these waters come across the vertical faults, with their help they appear on the surface in the form of mineral and thermo-mineral sources [Miljković, Kovačević, 2003]. The analyses of mineral waters prove the direct dependence between the hydro-chemical composition of waters and complex geological properties in which the formation and movement of waters have been taking place, throughout the geological history [Petrović et al, 2010]. According to Kozoljev formula water in Vrnjacka Spa is 2.520.000 years old [Filipović, 1992].

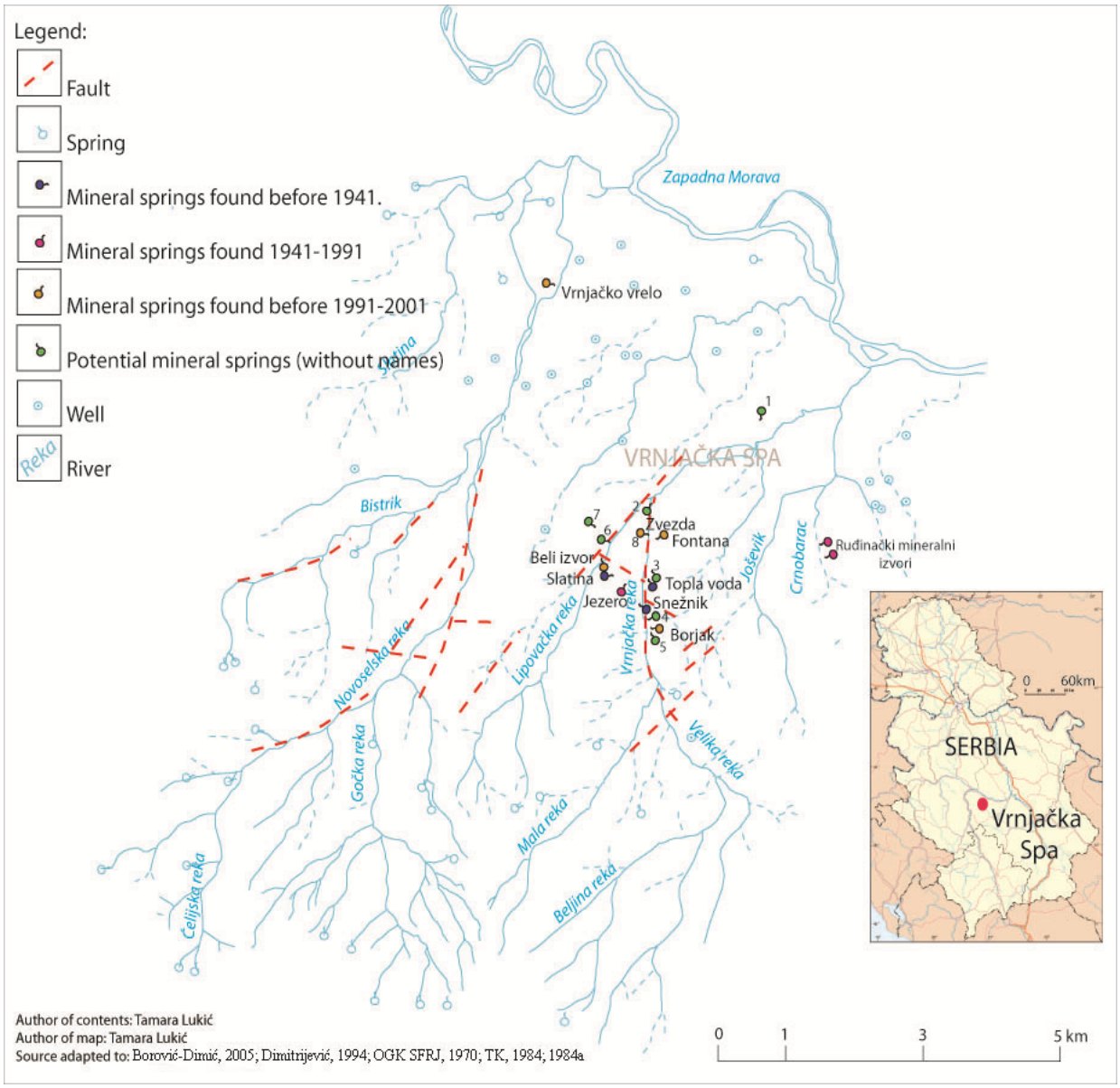

Figure 1. Geographic position of mineral and thermomineral wells of Vrnjačka Spa

Material and methods

In the process of drawing the map of geographical position of Vrnjacka Spa in Serbia and location of its mineral and thermo-mineral springs geographical and topographical maps have been used and also data gained from Real Estate Cadastre of the municipality Vrnjacka Spa [KNVB, 2009] and computer programmes Adobe Illustrator CS3 and Photoshop CS3. The problems of work have been approached critically. Part of the conclusion is the result of analysis of literary sources, synthesis and comparison of collected data.

The aim of the article is to find the answer on the following questions. What is the importance of mineral waters for the existence and survival of settlement? To what extant has the presence of this natural potential influenced the development of settlement? How much have they been used? How and to what extent are they being used in the present time? Do survival and development of settlement depend upon them? Answers to all these questions have been received using various literary resources and applying questionnaires, a form of an interview. A hundred respondents, who were between 20 and 65 years old and half of them were women, have been interviewed on the field. For that reason questions had open character, and answers to them were not predictable. Received data have been statistically analyzed and listed in the text, and some of them have been graphically presented.

Exploration and exploitation mineral and thermo-mineral waters in Vrnjacka Spa

Palaeozoic and Mesozoic formations on the territory of Vrnjacka Spa create waterproof of younger sediments of Neogene and alluvial deposits [Petković, Anđelković, 1976]. Within the complex of the oldest rocks of Palaeozoic schist and amphibolites, which are regarded as environment of low water permeability, arid environment, there occur lenses of marble which is 10 to 12 m thick, and within them large quantities of mineral waters circulate, not only in central but also in wider area of the Spa. Aquifer recharge is done by infiltration of falls and surface flows on the field, where marble appears on the surface, wherein the fissure structures represent directions. Prolonged circulation enables mineralization and heating of water, so in the area of Vrnjacka Spa it appears as mineral water with increased temperature [Milojević et al, 1974]. Serpentinites and igneous rocks build up low abundant water terrains to practically waterless terrain. In some places, in denser developed network of cracks, in serpentinites and serpentinitised peridotites, then in granites, weaker aquifers are formed, which nourish the springs, whose bounty is 0.01 to 1 l/s of water [Petković, Anđelković, 1976]. Serpentinites, which are quite tectonized, are also characterized by fractured porosity within it is formed a fissure type of aquifer of medium abundance. Their breakage permits nourishing of aquifer by infiltration of water from rainfall and surface flows [Milojević et al, 1974]. Such assumption has been confirmed by dozens of surface drilling. All mineral and thermo-mineral springs of Vrnjacka Spa occur in fissure lines, they are permanent and quite abundant. Thermal springs are located in the Valley of Vrnjacka River, in the area of fault, which stretches in the direction north-south. Cold springs are located on faults in the direction northwest-southeast [Miljković, Kovačević, 2003].

1. Mineral spring found before 1941

The first exploitation of mineral and thermo-mineral springs had primitive forms. People learned about them from stories and material remains. The remains of the first known swimming pool which dates from the period at the end of the 1st century until the second half of the 4th century was adjacent to well from Roman period, at the depth of 2.4m [Kanic, 1892; Živadinović, 1925; Kovačević, 2010]. There is no material evidence about the use of mineral waters in Turkish times, but indirect sources say that the Turks came to several months of summer healing by bathing in warm mineral water in Vrnjacka Spa [Mutavdžić, 1884]. The first improvised bathroom was made in 1859, when the spring of mineral water was divided from the river water. This year is considered to be the year of the opening of Vrnjacka Spa. According to the written sources, the central part of the Spa was a swamp of warm mineral water, in which a barefooted villager would step in, and using his hoe dig a hole in the mud for bathing of the interested bather [Borović-Dimić, 2001]. During the eighties of the 19th century, the Spa looked like unregulated river full of willow trees and sandbank with corn all around the river. The houses were scattered over the plum orchards, there were also few facilities for a shop, cafe and primitive pool [Topalović, 2007].

The research of Vrnjacka waters began at the end of the 19th century. Performing the research of this area in 1872, engineer Zigmondi having seen Vrnjacka springs before the intervention of 'cultural hand', wrote in his report that springs which could not even be counted, appear at the depth of 40 to 50 feet. Describing the transverse cracks compared to the main which stretches in the direction of Orlovac hill, Crkveno hill, Brankova Glavica, the researcher Zujovic states that deposition of silicon caused blockage of springs, so the water was appearing in other place, so this place looked like a big boiler in which water was boiling. The confirmation to the long appearance of these springs is provided by a large mass of quartz rocks in Orlovac hill and Crkveno hill [Stevanović, 1939].

'The founder company of healing sparkling-hot water' was founded in 1868 in Vrnjacka Spa and it represents the first tourist organization on the Balkans. The number of visitors in 1869 amounted 538. In the year 1870 the first official spa season was opened. The status of state spa Vrnjacka Spa received in 1883, and in 1884 the spa region was marked and the first master plan was adopted. Around the ordered flow of the Vrnjacka River there are trees and landscaped park, which was planted in the beginning of 1888. From 1891 to 1905 important technical works were performed on arrangement of springs, i.e. baths were capped at three sites. The process of communal equipment of the Spa was followed by its development. So in 1905, the public lights were set and sewer of waste water which was until the year of 1938 extended up to the Western Morava River (Figure). Regulation plans for Spa have been passed on several occasions, but very

soon they have been changed [Borović-Dimić, 2005; Milinčić, 2001]. Before the World War I the modernization of traffic was performed, water and sewerage networks were extended, as it was required by 'Law on spas and mineral water' of Ministry of Construction, Public Health and Internal Affairs in 1914. In 1924 the Ministry of Health proclaimed Vrnjacka Spa for natural healing spa of the first-class [Grujić-Šarčević, 2005; Topalović, 2008]. In the period between the two World Wars tourist turnover increased, in 1924 tourist organization 'Goc' was founded and the first spa sanatorium 'Sveti Djordje' was built [Stanković, 2008]. Private hotels and villas in the style of 'modern' were built in Spa. Very hot mineral water was also used to wash household furniture and floors of rented rooms, after the departure of patients infected with tuberculosis, because the Committee of regular visitors considered hot alkaline water to be strong disinfectant against tuber bacilli. Similar examples of the use of mineral water in everyday life are present throughout the whole planet [Fridleifsson, Freeston, 1994; Hepbasli, Ozgener, 2004]. The water was even used for washing the streets 'in order not to spoil the air with the dust'. Treetops with leaves were washed, to prevent wind to spread the dust on walkers [Borović-Dimić, 2001; Kovačević, 2010]. There exist more springs which were found before 1941, but only two of them were put in use 'Topla voda' and 'Snežnik'.

1.1. Thermomineral spring 'Topla voda'

The first analysis of 'Topla voda' ('Hot water') was performed by Baron Herder in 1835, when by order of Duke Milos he was going through Serbia and searching for salt. Vrnjacka water is lukewarm and acid, such water rarely appear in nature, it can only be compared to water of Schlossbrunn and Carlsbad [Herder , 1846]. Accompanying Herder's description, after the visit and analysis of this water in 1856, the Chief of military medical department doctor Emerih Lindenmajer [1856], describes it as very good for drinking and bathing. The favourable evaluation in Lindenmajer's report influenced the decision to arrange the strongest, i.e. the most abundant spring which represents the first known post-Roman capping. In the time of the Foundation society, close to it the spring was dug up and hot bath was built. The first complete chemical analysis of this spring was performed in 1874 [Stevanović, 1939]. According to it was classified in alkali carbon-acid terms. The specific weight at the temperature of 22°C is 1.0029, and the temperature of water is 36°C [Borović-Dimić, 2001]. For the sake of caution for gaining large amounts of hot mineral water, for professional suggestion on the way of capping and supervision of works a geologist from Karlsbad, dr. Jozef Knet was asked to come. The works began in 1905, on the area of the old bath that covered two acres [Sotirović, 1991]. The spring rock was intersected by cracks up to 15 cm wide, which were partly filled with ochre, aragonite and pyrite. Doctor Knet distinguished at the time five such parallel cracks which were stretching in the direction southwest-northeast and falling towards southeast under the angle of 80°. According to his opinion, the mineralization of Vrnjacka thermo-mineral water occurs at greater depth (in granite or gneiss), while dolomite plays the role of only aquifers. From the number of springs at the time, three were chosen for hot bath, four for supplying of drinking fountain and the tank of newly built bath which was soon called cold [Borović-Dimić, 2001].

After the World War I the number of visitors to Spa soon increased, which lead to thinking about the increasing the available amount of mineral water. According to reports from 1922, the central springs that supplied the Hot bath gave 100 litres of water per minute, on drinking fountain 21.5 litres, and springs in Kursalon and Cold bath gave 62.5 l/min [Leko, Ščerbakov Joksimović, 1922]. Compared to the amount of water from the time of capping in 1905, because of the appearance of wild springs out of the capping zone, these springs gave four times less amount of water. New capping was performed along the water-bearing crack and it included all springs except the Roman spring, which was, because of its lower temperature and weaker mineralization, capped separately. When the capping was finished the total amount of water rose to 5-6 l/s, with the temperature of 36°C and with more carbon dioxide [Sotirović, 1991a]. The construction of great Thermo-mineral bath, increasing the number of visits to Spa and decreasing of abundance of hot springs for a half, induced the need for new amounts of water. The capacities of the new bath were due to the lack of water used partly. In the season only half of 43 tubs and two pools were in use [Sotirović, 1991b]. For that reason in August 1931, the director of Spa in Carlsbad, Prof. Dr. Robert Kampe explained the decrease of the abundance of spring as the system of mutually interwoven cracks, through which, because of the increased inner hydrostatic pressure, caused by too wide cracks on the place of capping, through wild springs, and flew mineral water [Filipović et al, 1992].

The first drillings in 1932 were performed twenty meters north of the line of the earlier capped thermal spring. At the depth of 45 metres hot water was found with the abundance of 16 l/s, and temperature of 35°C. This water with the abundance of 5.5 l/s supplied the baths and fountains until the October of 1933 when it stopped flowing [Nešić, 1936]. The other probe was set 39 m north of the line of the earlier capped thermal springs. The crack was cut at the depth of 140-144 m and capped with the abundance of 9.7 l/s with the temperature of 36.2°C. Its water supplied baths and drinking fountains from January 1934 until the end of July 1935 when the decrease of temperature to 33°C was noticed. In December of 1933 a thermal crack, 32.5 metres south, was examined in order to check Dr Knet's claim, it falls towards the southeast. The drill went through alluvium, serpentinite and schist. A small amount of hot water, of weak mineralization and lower temperature was obtained. It proved the assumption that Vrnjacka thermal crack falls towards the north. For that reason in the beginning of 1934, at the distance of 74.5 m north from the line of the old capping, next probe was set. After the alluvial deposits the drill went through magnesite, clays, and marls, sandstones of Cretaceous age, serpentinite with dolomite interbeds, thin layers of shale, pure serpentinite and schist [Stevanović, 1939]. Water was obtained with the temperature of 38°C, with slightly lower amounts of carbon dioxide and abundance of 8 l/s. Dr Kampe reduced diameter of the inlet pipe, the water temperature was reduced to 36.8°C, with increased amounts of carbon dioxide and abundance of 6 l/s. Except the water that was obtained from serpentinite, this probe obtained water also from schist with abundance of 0.36 l/s, and the temperature of 41.4°C and mineralization of 2.3 gram/l, which was separately capped and mixed with the water from serpentinite, until the end of 1936. Then because of the landslide of unprotected rocks at depths greater than 230 m, the probe got in mud, and collapsed material could not be pulled out. For that reason the probe was buried to depths of 230 m, and the water from schist was lost [Borović-Dimić, 2001]. With the repeated capping of the probe, from the depth of 300 m the main spring is supplied with water and also the Thermo-mineral bath; the main spring is settled east of the Thermo-mineral bath [Filipović, 2003]. The spring Topla voda (Hot waters) has the highest average abundance of 6.8 l/s. The minimal abundance of this spring was recorded on the 10th of August 1961, in the amount of 3.3 l/s. The maximal abundance of 20 l/s was recorded on the 1st of April 1938, and on the 11th of March 1940 [IHRGFB, 1992]. Hot mineral water has sodium hydrocarbon, it is slightly mineralized, according to pH values it is slightly acid, and the temperature is homeothermn (Table 1). In the decision of the Municipal Assembly of Vrnjacka Spa on the use of natural and medicinal factors it was specified that the most important spa resource, mineral water, would use the company 'Merkur'. The excess water that occurs after the use of Tople vode by 'Merkur', takes over the factory for bottling water 'Vrnjci' [Župac, 2005a].

Table 1. Physical properties of mineral and thermo mineral water of Vrnjacka Spa. Source adapted to: [Nešić, Balšić, 2007]

Spring		'Topla voda'	'Snežnik'	'Slatina'	'Jezero'	'Beli izvor'	'Borjak'	„Vrnjačko vrelo'	'Fontana'
Total mineralization (g/l)		2.76	2.21	3.64	3.27	3.73	1.35-2.14	-	-
Dry residue (g)		1.81	1.45	2.45	2.11	3.42	2.08	1.68	1.08
Specific gravity (g/l)		1.001675	1.001500	1.002000	1.002830	1.002300	-	-	-
Radioactivity	U (µg/l)	<0.2	<0.2	<0.2	<0.2	<0.2	-	-	-
	Rn (Bq/l)	0.5	1.2	6.2	0.7	2.4	-	-	-
	Ra (Bq/l)	<0.05	<0.05	<0.05	<0.05	-	-	-	-

Water hardness (German degorees)	General	28.84	31.05	34.44	33.32	32.76	9.24	52.10	39.20
	Transient	28.84	31.05	34.44	33.32	32.76	9.24	52.10	39.20
	Permanent	0	0	0	0	0	0	0	0
Electrical conductivity (μS/cm)		2.780	2.054	3.500	3.000	3.200	2.300	2.840	1.222
pH value		6.70	6.40	6.47	6.65	6.70	6.40	7.82	6.84

1.2. Mineral spring 'Snežnik'

The Commission of the Government of Kingdom of Serbia from 1896 noted that there existed cold mineral springs. One with the temperature of 14.2°C was located along the Vrnjacka River. Although people knew about the existence of springs, they were not used until one Austro-Hungarian officer, during the occupation in 1916, became interested for plateau close to Brdjovicka mill, where the snow melted away quickly. Several soldiers dug up the plateau and there at the depth of 1.5 m the water flew. At the end of the war, people started using this water for treatment. Grateful for the cure, a teacher in 1920 arranged the spring and built the fountain covered with wooden eaves [Borović-Dimić, 2001].

Next to the spring there is a borehole made in serpentinite rocks. The oldest rocks in the wider area are Paleozoic schist and amphibolites, with layers of marble through which considerable quantities of mineral waters circulate. The water circulates through serpentinites and gabbros, which are quite tectonically disturbed, implying very good filtration characteristics and also increased concentrations of Mg ions (55.4 mg/l) [Nikolić, 2009]. The presence of geochemical assemblage Cs, Rb, Si, Ge, indicates that granitoids influence water forming. There is granitoid located on the terrain surface 10 km to the South-East of Vrnjacka Spa (Zeljin Mountain and Crni Vrh).

With regulation of Vrnjacka River and Brdjovski stream the spring was protected from flooding and sediment [Stevanović, 1939]. The chemical analysis of the spring on the river bank was performed in 1920 in National chemical laboratory [Leko, Ščerbakov Joksimović, 1922]. The more complete analysis was performed by professor from Paris University, Bardet in 1924. It showed the traces of arsenic, and spectral analysis proved also the presence of silver, beryllium, potassium and titanium. Traces of aluminum and iron were determined in later analysis by National chemical laboratory. In the meantime guests and locals drank the water at the spring, bottled it and exported throughout the country unlicensed or under the supervision of spa management. In the year of 1937 the Ministry of social politics ordered the most urgent recapping of the spring 'Snežnik'. Analysis of the National chemical laboratory showed that all four springs belong to the special type of water, which contains less alkaline, and more natural-alkaline metals than 'Topla voda'. Since the factor F of cold waters of 'Snežnik' which amounts 7.8 1 does not agree with the factor F of 'Topla voda', ratio of dissolved solids is not the same. Also, it was determined that all springs belong to the same 'fumarol' cracks. The difference is in weight of dry residue, the amount of free carbonic acid and in the ratio of alkali and natural-alkali metals appears either because the samples were not taken at the same time or because of the bifurcation of mutual 'key' before the mineralization [Stevanović, 1939].

In the period between 1978-1980, for the needs of the new building, where there are drinking fountains, recapping and research drilling were performed, with three research drilling and the well Sz-1/79. The first two drill holes were positioned east, and one west of the Vrnjacka River. The drill hole B-1/78 went through alluvial-diluvial layer of clayey and gravel debris and through serpentinite to the depth of 30.4 m. Through the same soil composition went also the other drill hole to the depth of 51.5 m, while the third one located in the fissure zone of Paleozoic schist, to the depth of 67.8 m and mainly went through serpentinite [Filipović et al, 1992]. After the three exploration drill holes were carried out the exploitation well was constructed.

According to the Alekin classification [1970] the water of 'Snežnik' is sodium, calcium, magnesium hydro-carbonated, slightly mineralized, the pH is slightly acidic, and the temperature is cold (Table 1, 2). Higher content of Ni (9.12 μg/l) indicates the presence of ultra-basic rocks (gabbros and diabase) [IHRGFB, 1992]. The 'Snežnik' spring, which is used for balneo therapy, is

also used for water bottling under the name 'Voda Vrnjci' [Nikolić, 2009]. 'Voda Vrnjci' is characterized by an increased TDS up to 1174.80 mg/l and increased content of CO_2 (700–1044 mg/l). By self-flooding 'Snežnik' originally gave between 0.1 and 0.3 l/s. This abundance was increased to 0.9 l/s with capping the contact of phyllite and serpentinite at the depth of 216 and 220 m [IHRGFB, 1992].

Table 2. Review of basic indexes of some springs of Vrnjačka Spa. Source adapted to: [IHRGF, 1998; ZZZZ, 1999; ZZZK, 2001]

Components		'Topla voda'	'Snežnik'	'Slatina'	'Jezero'	'Beli izvor'	'Borjak'	'Vrnjačko vrelo'	'Fontana'
Caped interval (in meters)		300	216-220	10-15	218-248	342	62-63	170-250	150-220
Generosity (l/s)		6.8	0.9	2.0	1.5	0.6	0.1	2.5	0.5
Water temperature (°C)		36.6	16.8	14.0	25.5	29.5	16.0	17.5	17.0
Total mineralization (g/l)		2.76	2.21	3.64	3.27	3.73	1.35-2,14	-	-
Content of therapeutic active components (mg/l)	$Na^+ + K^+$	621.23	393.76	903.21	701.96	942.77	639.63	-	-
	Ca^{++}	58.11	105.41	147.89	142.28	116.23	12.02	12.02	14.42
	Mg^{++}	83.66	76.97	59.94	57.51	63.84	32.85	32.85	178.97
	Na^+ (PF)	-	-	-	-	-	30.0	30.0	-
	K^+ (PF)	-	-	-	-	-	2.0	2.0	-
	Cl^-	39.70	31.90	46.08	35.45	48.21	2.89	2.89	55
	HCO_3^-	2176.10	1682.38	3060.98	2519.30	3088.43	274.5	274.5	-
	CO_3^-	1070.20	827.39	1505.38	1238.99	1518.88	1360.79	-	-
	SO_4^-	1.20	11.20	5.00	2.50	2.50	2.56	2.56	-
	NO_3^-	0.35	-	-	-	-	2	2	0.659
	$CO_{2\ free}$ mg/l	972.0	686.4	1073.6	783.2	677.6	26.4	26.4	-
	Fe (total)	5.40	4.70	1.30	6.20	4.90	0.058	0.058	0.927
	Mn	0.01	0.01	0.00	0.01	0.01	0.008	0.008	0.0
	NH_4	0.00	0.00	0.00	0.00	0.00	0.05	0.05	-
	NO_2	0.00	0.00	0.00	0.00	0.00	0.003	0.003	0
	Consuption $KMnO_4$	1.44	2.08	0.64	2.40	2.24	3.79	3.79	6.32
Type of water		$Na - HCO_3$	$Mg - HCO_3$	$Na - HCO_3$	$Na - HCO_3$	$Ca - HCO_3$	$Na - K - HCO_3$	$Mg - HCO_3$	$Mg - HCO_3$

1.3. Mineral spring 'Slatina'

The Commission from 1896 noted the local 'Slatina' which had the temperature of 12.5°C [Filipović et al, 1992]. Researches around 'Slatina' continued in 1937. When the abundance was measured it amounted 400 grams per second. Regulating the Slatina stream neighboring swamps were drained, and the area was improved with stepped terraces, paths, trees, rose gardens and ornamental shrubs [Todorović, 1938]. In the year of 1978 four research drill holes were placed there. Thirty meters southwest of the natural spring 'Slatina' the first drill hole B-1/78 was set at the depth of 44.5 m. The second one, B-2/78 was set 20 m northwest of the spring, at the depth of 42 m. The third drill hole B-2/78, which was drilled 100 m east of the spring, went to the depth of 30 m and did not find aquifer, while B-4/78 was set next to it and drilled to the depth of 42 m [Filipović, 2003]. All drill holes went through Paleozoic schist, which were mixed in higher layers with quartz sand, and in lower with quartz. In the surface layer were detected higher amounts of

carbon dioxide and smaller amounts of mineral water, which supported by the gases through cracks, particularly in zones of quartz sand, infiltrates from the deeper parts. As the water temperature of drill holes and spring is the same it can be concluded that cracks in this zone are quite compressed. The water level at drill holes is 31 m, and at springs is 10 to 15 m. According to this data recapping of the spring 'Slatina' was performed in 1984 [Filipović et al, 1999]. 'Slatina' is located on the southwest side of Cajka hill, in a place between valleys of Vrnjacka and Lipovacka River that is called Terapija [Miljković, Kovačević, 2003]. Water from 'Slatina' is sodium hydro-carbonated, slightly mineralized; the pH is slightly acid, carbon-acidic of medium concentration, and the temperature is cold (Table 1). Its abundance amounts about 2 l/s [IHRGFB, 1992]. In the beginning of the 20th century the heated water from the spring 'Slatina' was used for hydrotherapeutic treatments. The stock company built the facility in 1911 and opened 'The Institute for hydro and electrical treatments' with about 20 rooms. In 'Terapija' during the World War I there was so called 'Berry's hospital', whose head was dr. James Berry, who together with other doctors and nurses treated the wounded Serbian soldiers, but also civil population of Vrnjacka area [Vuković, 1985].

2. Mineral springs found from 1941 to 1991

With the attention to arrange Vrnjacka Spa in the way it is suitable for spa centers, after the World War II the following actions were taken: electrification, organizing educational institutes (1950-1970), libraries, museum 'Belimarkovic', cinema and Cultural centre. By the end of the 70-ties of the 20th century the problem of sewerage system was solved [Kovačević, 2010]. The town receives the physiognomy of European balneological centre and the leading centre of continental tourism in Serbia. During the 70-ties of the 20th century hotels were built with capacity of several hundred rooms. To serve clientele local population is engaged, but the need for manpower attracted population both from the region, and outside [Kovačević et al, 2007]. It was planned to form secondary town cores in parts of Banja in which it widens spatially, and those are Dubrava and Piskavac. Vrnjacka Spa has grown together with suburbs, such as: Rudjinci, Lipova and Novo Selo. Works on capping until the middle of the 20th century as well as new geological, hydro-geological and hydro-chemical researches of the wider area of Vrnjacka Spa from the 70-ties gave detailed review of characteristics of this terrain as well as the possibilities of capping. For the purpose of research 14 capped bores were accomplished and the record of springs and wells which includes 65 natural phenomena and 165 drilled wells was made [Pešterac, Natević, 1970]. In this period, only mineral spring 'Jezero' has been arranged, and Rudjinacki mineral springs have been researched in more detail.

2.1. Mineral spring 'Jezero'

In the area between the two springs 'Snežnik' and 'Slatina', next to a small lake, in 1978 thermo-mineral water 'Jezero' was discovered (Figure). The research bore VBJ-1/78 was made up to the depth of 260 m, and the groundwater of thermo-mineral water was discovered at the depth of 218 to 248 m in the layer of marble. The work was continued in 1985 when about 10 m from the first drill, the new drill VBJ-2/85 was set [Filipović, 2003]. Water from Jezero is sodium hydro-carbonated, poorly mineralized; pH value is slightly acidic and weakly acidic hypothermal [IHRGF, 1998]. The water temperature is about 25°C, of the same basic type as the other Vrnjacka water, but of specific mineralization. By opening the aquifer of yield of 10 l/s, with the tendency of decreasing, it stabilized at 1.5 l/s [IHRGFB, 1992]. Water exploitation is performed by self-flow which is set on the level of the surface of the terrain, i.e. 7 meters below the hydrostatic level, using the effect of 'gas-lift' self-pumping [Belić, 1978; Geozavod, 1986].

2.2. 'Rudjinacki' mineral springs

In wider spa area, in village Rudjinci, in the region of stream Crnobarac, there are two springs of mineral water with increased content of carbon dioxide. According to the research of Leko et al [1922] Rudjinacki spring had temperature of 13°C, and in one liter it contained 0.5900 grams of dry residue. In 1988, research drills with two bores were performed. One of them was performed up to the depth of 360 m, because of the damages the drilling stopped. The other bore gave at the depth of 10 to 15 m self-flow of 0.5 liters per second, of mineral hydro-carbonated water, magnesium type, with mineralization of 0.5 g/l [Filipović et al, 1999].

According to results of research by Filipović [2003], Rudjinci groundwater belongs to dense and cracking. On the basis of two researched drills with the depth of 328 and 360 m, temperature of Rudjinci water is 14°C, and pH is 6.9. So, it is called and neutral. By field research it was determined that Rudjinci mineral springs are not presently exploited.

3. Mineral springs found from 1991 to 2002

In the last decade of the 20th century Yugoslavia experienced changes at all levels. Secession of most republics, Slovenia, Croatia, Bosnia and Herzegovina and Macedonia happened. Except in Macedonia, they were followed by civil war, great emigrational circulation, economical crisis, which was conditioned by embargo and inflation. In the observed decade started the process of transition, owner transformation, i.e. privatization [Bartlett, 2009]. The development of Vrnjacka Spa has constantly been disrupted by the problem of water supply. It manifested through often suspension of delivery of water. The problem was solved in 1992, when the central system of water supply from the spring on Goc was established [Milinčić, 2001]. The search for new springs continued. The idea was based, as competent sources claim, on the fact that in the moment of privatization of mineral and thermo-mineral springs bigger price could be achieved if another new spring was found. From the mentioned springs that were found after the year of 2002, the significant contribution to the development of Vrnjacka Spa has been given by 'Beli Izvor' and 'Vrnjačko vrelo'. 'Beli izvor' with its healing properties, i.e. soothing effect influenced the increase in the number of tourists, and 'Vrnjačko Vrelo' had more marketing role. Bottled 'Vrnjačko vrelo', placed on the market in Serbia, as well as the Balkan region, reminds the consumers of the healing quality of Vrnjacka waters.

3.1. Mineral spring 'Beli izvor'

In search of new quantities of water, during the year of 1992, researches were conducted in areas of upper course of Lipovacka River and Lipovacki stream. 'Beli izvor' is located about 150 m from mineral spring 'Slatina' and about 350 m from 'Jezero'. Geological and hydro-geological researches gave good reason for placing a drill at the place of this fissure zone. The drill IGB-1/92 and drilling through Paleozoic graphitic and gray-greenish schist partially cracked and filled with quartz and calcite, up to the depth of 506 m, it confirmed the presumption about the existence of more favorable conditions for catching hot springs in the area of Lipovacka River [Filipović, 2003]. The amount of water at self-flow was at first 2.5 l/s, and after two months it stabilized at 0.6 l/s. Discovered mineral water belongs to the category of sodium hydro-carbonated, carbon-acidic and radioactive hypo-terms with the temperature about 29.5°C at self-flow, while at the depth of 342.4 m, the temperature is 36.5°C similar to the one at the spring 'Topla voda'. According to chemical content a new, but mixed type of water was obtained, similar to other types of Vrnjacka water, but different from them [Lazić et al, 1995]. Competent institutions assessed that it could be used for balneo-therapeutic purposes, by drinking, as remedy and that it could have the best impact in the treatment of gastrointestinal tract, metabolic disorders, kidney and urinary tract disorders [Filipović et al, 1999]. This water is very good for rheumatic and skin diseases. For that reason next to this spring people can be seen washing their hands and faces, putting water compresses or their diseased limbs in water containers. Water from 'Beli izvor' is sodium, calcium hydro-carbonated, poorly mineralized, pH is slightly acidic and according to the amount of carbon-dioxide it is hypothermal.

3.2. Mineral spring 'Borjak'

The locality of Borjak is 700 m upstream of the mineral spring 'Snežnik' (Figure). Its appearance is explained with the fact that along the riverbed of the Vrnjacka River stretches cleft which causes, or enables the appearance of 'Snežnik' and 'Borjak'. Miljković and Kovačević [2003] wrote that on the third fumaroles crack, where 'Snežnik' is located, there is a covered spring of mineral water. Natural spring of mineral gas water with the abundance of 0.1 l/s and with carbon dioxide of 238 mg/l which was confirmed with later hydro-geological prospection of Vrnjacka territory. The research drilling started in 1992, to the depth of 150 m. At the depth of 62.5 m was caught mineral water containing carbon-dioxide of 1.3 g/l and pressure of 20 cm above the surface. Up to 40 m the drill went through serpentinites, gabbros and amphibolites. At the beginning of 1997, a new drill was set BLV-1/97, depth 175 m, at the depth of 41 to 61 m it recorded the presence of gabbros, which were not recorded until then in the Vrnjacka territory. The drill was converted into observational facility and regime observation of physical and chemical properties is in progress [Filipović et al, 1999]. Water from 'Borjak' spring is sodium, potassium hydro-carbonated, poorly mineralized; pH is slightly acidic, with cold temperature. The Company 'Voda Vrnjci' use water from the drill 'Borjak' [Župac, 2005a]. Water from spring 'Borjak' is bottled and distributed in the territory of Serbia and some countries in the region as 'Voda Vrnjci'.

3.3. Mineral spring 'Fontana'

On the right bank of Vrnjacka river, about 300 m below the mineral spring 'Topla voda', the Institute of hydrogeology of Faculty of Faculty of Mining and Geology from Belgrade in 1999, during the procedure of hydro-geological research because of the rebuilding of part of the foundation of hotel 'Fontana', set research drill F-1. The goal was to determine with minimal research works hydro-geological characteristics of the terrain to prevent self-flow of water in the foundation and basement premises of the hotel 'Fontana'. In part of the terrain towards the Vrnjacka River, under almost 3 m of poured material, there is alluvial deposit whose thickness in the zone of the hotel 'Fontana' is 2-3 m and it grows in the river direction. Heterogeneous complex of sediments of Miocene Pliocene age built of clay, marl and conglomerate thickness from 3 to 30 m, are located in the basement of alluvium, and partly on the surface. Below this complex are flysch formations from Lower Cretaceous period registered by drill in the range of 8 to 15 meters, whose thickness increases to about 60 feet towards the 'Topla voda'. Based on earlier geophysical research and records from new drill in the yard of 'Fontana', it is assumed that the contact between the Cretaceous flysch and serpentinites is tectonic. As next layer of lithological profile serpentinites occur at 15 m depth and the depth drops to about 70 m in the area 'Tople vode'. It is assumed that this is a consequence of cross fault in part of the field between the Probe III 'Topli izvor' and Probe B-11 under the hotel 'Fontana'. The fault led to lowering of blocks of serpentinites and schist towards the 'Topla voda' with a jump fault of 60 m. On the northwestern and southwestern parts of the terrain serpentinites occur also on the surface very changed, altered, bleached, and very rotten and decayed, the color is light green. Deeper serpentinites are compact and dark green, sometimes intersected with veins of magnesite. On the contact with the schist are stronger silicified, solid and compact. The occurrence of serpentinites with calcite veins and quartzite show that in the geological past there was the zone where carbon-mineral water flew [Milojević, 1974; Filipović et al, 1992; 1999]. Below the serpentinites layer there are the oldest rocks of the Paleozoic age made of schist, calk schist and amphibolites that in the area of the hotel 'Fontana' occur at the depth of 150-220 m in the southwestern part of the surface. The temperature of obtained water is 17°C. Chemical analysis was performed in the laboratory of factory 'Voda Vrnjci'. Water in the hotel 'Fontana' is partly used as a supplement to drinking water, partly as a supplement to the pool, and partly as technical water. Its bottling has been an option. Water is a leading concern of Hotel-touristic company 'Fontana'.

3.4. Mineral spring 'Zvezda'

At the end of the year of 2000, Hotel-tourist company 'Fontana' was an investor for its needs of hydro-geological studies, performed on the left bank of Vrnjacka river, about 300 m below the spring 'Topla voda' in the yard of the hotel 'Zvezda'. The aim was to partly solve the problem of water supply of the hotel 'Zvezda'. The first exploration bore was performed to the depth of 29 m [Jocić, 2000]. Dynamic groundwater level of 2.5 l/s was stabilized at 5.0 m. Below the covered soil clay gravel composition of about 1.9 m thick, the Quaternary gravel coarse grain was found, which were brought by Vrnjacka river and settled across the older graphite rocks, and rare across chlorite schist that up to 19 m occur in the form of clayed inwards, and to 29 m are broken and decayed. Quaternary gravel and decayed graphitic and chlorite schist represent hydro-geological panels that allow the flow and accumulation of ground water. Water from upper gravel was through the filter granules next to conduit pipe indirectly introduced into the well. This water at the moment of abstraction was 19.5°C and pH value is 7.32. This spring is not exploited.

3.5. Mineral spring 'Vrnjačko vrelo'

In 1998, geo-electrical research confirmed that at depths below 100 m large quantities of groundwater can be expected. In the middle of 1999 the exploration well was turned into the exploration facility. Drilling by coring continued to 166.6 m, when by self-flow occurred water eruption. The exploitation is performed from the depth of 184 m and from depths between 170 and 250 m, and bottling is done at the spring, without any additional filtration. The water temperature is constant, of about 18.7°C. Hydrostatic pressure is stable, as is the regime of yield, which from 3.5 got stabilized at 2.5 l/s. The water is bacteriological sterile, indicating noninterference with the shallower aquifers. Still water 'Vrnjačko vrelo' falls into the category of low-mineral or oligo-mineral. According to its chemical and gas composition this water is genetically distinct from other Vrnjacka mineral water, indicating the existence of hydro-geologic barriers built of Paleozoic rocks which are week aquifers. It is connected to the Neogene series of rocks and serpentinites, with the possibility that some of the water is abstracted from cracking peridodite mass. Weak mineralization, below 200 mg/l, as well as low content of hydrocarbons provides a daily

consummation without any restrictions. Favorable concentration of magnesium has a beneficial effect on digestion; protect blood vessels and reducing the reaction to stress inductors. In 2001, the construction of bottling plant and the exploitation of this water started. With dry rest of about 250 mg/l, with the optimum hardness of 9.5 d°H, and very low organic load, low content of sodium, chloride and nitrate, with the ratio of calcium and sodium that makes it drinkable, with a high percent of magnesium, it belongs to rare waters of high quality which are bottled in Europe, like the waters 'Perrier' or 'Evian' [Ferrier, 2001]. As magnesium water gains more importance in prevention, doctors recommend the water from this spring for everyday use. It is bottled up without any technological treatment and physical disinfection, as natural non-carbonated and carbonated with a maximum CO_2 concentration up to 5 grams per liter. The factory has its own chemical laboratory, which monitors daily the quality of water from spring to bottle, and also the constancy of declaration.

4. Potential mineral springs

Various studies indicate that there are good predispositions for discovery and exploitation of new springs and new quantities of thermo-mineral and mineral water. During these detailed geological, geophysical and hydro-geological researches on the narrower and wider Vrnjacka territory several potential zones were mapped. Deep drilling project of zones of 'Topli izvor' would provide the possibility of making research-exploration well, which would permanently ensure sufficient quantities of hot mineral water for development of Special hospital of 'Institute for prevention and treatment' and bottling plant 'Voda Vrnjci'. Areas around the mouth of the Lipovacka River to the Vrnjacka River, and also the area of Lipovacka River on the territory of Church Hill, opposite Topla voda, with the drill bores from 1000 to 2000 m, it would provide the opportunity for catching large quantities of warm water for multipurpose use. The next location would be exploration of mineral water in the factory for bottling mineral water 'Voda Vrnjci' where the probe is placed at 1020 m of depth, which is due to the appearance of methane and destruction, abandoned [Filipović et al, 1999]. On Branko top, hill above Vrnjacka Spa, there is a spring of mineral water, which was a few decades ago primitively capped by the residents. In 1999 they began to supervise it. New researches are inevitable. But during all these and future research certain precondition must be respected, and that is that the current springs, in both quality and quantity of water, must not be compromised. The support for that is the fact that the testing of some old wells, at already exploited springs has determined the mutual interconnection of cracks and pores in the broader territory of Vrnjacka Spa. Construction of buildings around the known springs, deterioration of water quality of Vrnjacka and Lipovacka River, pond in the park, and irregularity of wastewater and storm water basins can affect the quality and quantity of mineral water. Therefore, the overall future development of Vrnjacka Spa must be subordinated to the preservation of quality and quantity of water. In development projects the special responsibility is on companies and institutions whose work is based on drinking and mineral water: Special hospital for the prevention and treatment of digestive diseases and diabetes 'Vrnjacka Spa', the company 'Beli izvor' and factory 'Voda Vrnjci', as well as Assembly of municipality of Vrnjacka Banja. They have already, in cooperation with relevant professional institutions in Serbia, such as the Institute of Hydrogeology, Faculty of Mining and Geology, 'Geozavod', 'Geosonda', 'Hidrosonda', 'Naftagas - Novi Sad', 'Hidro-projekt', 'Kosovoprojekt' Belgrade and others were most responsible in relation to research projects, protection and exploitation, as well as ordinary mineral water.

Characteristics of Vrnjacka Spa mineral and thermo mineral waters

By analyzing of the results of research of six Vrnjacka waters and their comparing the following results were obtained. Thermo-mineral water from the site 'Topla voda' is connected by gaps to system fissure zone in the serpentinites, and from the site 'Jezero' to fractured karsts system of fissure zones in Paleozoic marbles. Mineral water, sites 'Snežnik' and 'Borjak' are connected to gaps in the system section fissure zones within serpentinites, and 'Slatina' and 'Beli izvor' are connected to the intersection of fissure zone in schist (phyllite and serite schist) [Milojević et al, 1974].

Physical properties

According to physical features, Vrnjacka waters are mutually different. According to color they are slightly yellow, only 'Slatina' is yellow, and 'Topla voda' is neutral. According to the

fuzziness, it can be said that they are transparent, except for 'Slatina' and Borjak who have little blurry. Vrnjacka waters have no smell. However, older visitors of Vrnjacka Spa remember that Snežnik gave the smell of 'rotten egg'. According to them, the smell is gone from 'moving' the spring in the local facilities. Vrnjacki mineral springs vary in temperature. According to the temperature of groundwater Petrović et al [2004] classify them as: 'Snežnik', 'Slatina' and 'Borjak' have cold water, 'Jezero' and 'Beli izvor' are hypothermal, while 'Topla voda' is homoeothermic. Considering the fact that the degree of mineralization of Vrnjacka water ranges from 1 to 5 g/l, Vrnjacka mineral water are poorly mineralized. Therefore, they are of pleasant organoleptic properties and well tolerated, so they are suitable for therapeutic use, especially for internal use. The specific gravity of Vrnjacki springs at a temperature of +4°C vary to a lesser degree, ranging from 1.001500 g/l in 'Snežnik' to 1.002830 g/l at the spring 'Jezero'. General hardness is consistent with the transient, resulting from the hydro-carbonated ions of natural-alkaline metal that are deposited by cooking. Considering the fact that the value of the permanent water hardness of Vrnjacka water equals zero, it means that other salts of natural-alkaline metals are not in it. Since the pH of the Vrnjacka water is mainly less than 6.8, it can be said that they are all weak acid. 'Fontana' is one of the neutral water, and 'Vrnjačko vrelo' is alkaline.

Chemical features

Chemical compositions of Vrnjacka water are similar, indicating the connection of these waters in a larger scale. The same mineral ingredients are found in different proportions [Petković, Anđelković, 1976]. Among them, the amount of carbon dioxide expressed in grams per liter, classifies Vrnjacka water into the category of slightly acidic water because in all waters it ranges from 0.5-1.4 g/l. Only 'Slatina' belongs to the category of carbon-acidic waters of medium concentration (Graph 1).

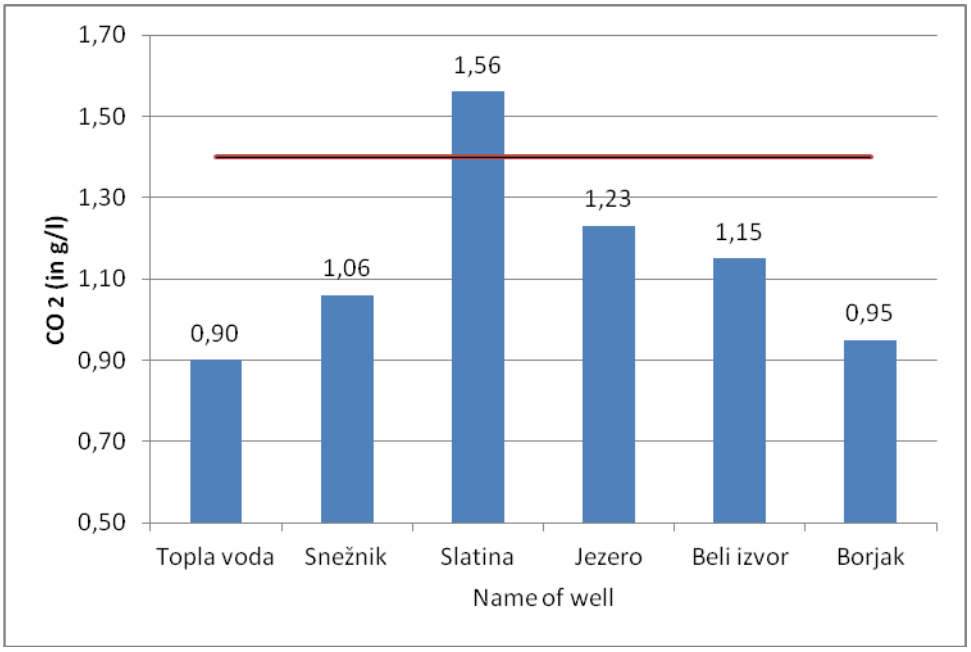

Figure 1. The amount of carbon-dioxide in mineral and thermo-mineral springs of Vrnjacka Spa Source adapted to: Ref. [IHRGF, 1998; ZZZZ, 1999; ZZZK, 2001]

Other differences in chemical composition are due to the characteristics of locations where they occur. Alkalinity, carbonic acid and the presence of different amounts of ions Na, Ca, K, Mg, Mn, Ni, Zn, Cu, Pb, Li, Ba, and then also Cl, Br, I, sulfates, etc. caused the healing effect of water on some diseases of human body. The healing effect caused the water to be noticed [Miljković, Kovačević, 2003]. Legend say that in the second half of the 18th century, one man from Vrnjci village gave this water to his sick horse, which after three weeks it regained strength. Their use by diverse types of therapies: hydro, balneological, physical, kinesis, electro, paraffin, drinking of

water, thermal, inhalation and others, can indicate a wide range of diseases – cardiovascular, gynecological, gastrointestinal diseases and pancreas, kidney, urinary tract etc.

State of the use of mineral and thermo mineral waters in Vrnjacka Spa

The first time that it was mentioned and recorded that Vrnjacka mineral water was taken and drank outside the spring happened in 1870, in Program for raising mineral water in the village Vrnjci, which was sent by Funding Company to Chief of the district Kruševac [Mutavdžić, 1884]. According to the writing of Jugović [1970], even in the year of 1876, a pharmacist from Belgrade named Dilber carried the water in bottles and sold it in Belgrade. 'Wild' carrying of hot water had lasted until the discovery and capping of 'Snežnik', when exploitation and export of its water started. Bottling of mineral water from the spring 'Snežnik' was free, with no control and unhygienic [Borović-Dimić, 2001]. The World War II interrupted the organizing bottling and export of water outside Vrnjacka Spa by the state. Physic-chemical properties of then-known mineral water and their potential exploitation were explored during the sixties of the 20th century. It was ascertained that of the total capacity of mineral resources (220 million liters), Spa center 'Vrnjacka Spa' uses only 24 %, or 52 million liters of water [Pećinar, 1965]. Trial production began in 1970. By technological means, from natural mineral water the iron is removed, and carbon dioxide is added. The increase in demand caused the need for greater capacity, so in 1973 the construction of factory began, which started to exploit the spring of hot mineral water, with the capacity of 60 million liters per year. The standard and quality of table mineral water 'Vrnjci' has been recognized by the International Association of Manufacturers of Mineral Water in Europe. In the year of 1986, more than 27 million liters of table water was produced, which made up 4.9% of the total Yugoslav production with 19 filling stations and 14.4 % of production of mineral water in Serbia. Until 1992, water 'Vrnjci' was present in Germany, Great Britain, America, Japan and Australia and thus contributed to promotion of health and tourism values of the spa Vrnjacka Spa. In the year 2002, 'Vrnjci' became joint stock Company for exploitation of mineral water and production of soft drinks. Water has been pumped for years from the spring 'Topla voda' in Vrnjacka Spa, and now the spring 'Borjak' is used. Today, it is sold in Macedonia, Bosnia and Herzegovina, Germany and Canada [ID, 2008].

Water from mineral springs is used in healing and therapeutic purposes and is bottled and sold as such. The following facts illustrate to what extent it is developed. The most important health institution and developer of healing tourism is Institution of Prevention, Treatment and Rehabilitation of the digestive system and diabetes 'Vrnjacka Spa', which was establishes in 1976, on the grounds of the State clinic in which since 1948 the experimental and scientific research in the field of balneology was performed, and that has in the meantime been known as the 'Natural Spa' and 'Center for rehabilitation and treatment of digestive diseases and diabetes - Vrnjacka Spa'. Specialized institution for treatment and rehabilitation has gained high status and reputation in health care in the areas of prevention, treatment and balneological rehabilitation. Since 1998 it has the status of teaching base of the Medical Faculty in Belgrade in the field of balneology [Borović-Dimić, 2001]. Special hospital performs stationary and policlinic health care activities, implementing health care programs and provides preventive diagnostic, therapeutic and rehabilitative health services in the field of digestive diseases, diabetes, chronic rheumatic and degenerative diseases and diseases of urinal-genital tract. It monitors and studies the health of the population, health culture, hygiene conditions and it proposes measures for their rehabilitation. It implements measures for health education on the formation of behavior that leads to promotion and preservation of health. In the field of prevention it investigates the causes and occurrence of disease spreading and suggests measures for their prevention, efficient and quality treatment and rehabilitation. It monitors and conducts professionally scientifically established methods for diagnosis, treatment and rehabilitation and establishes professionally methodological and doctrinal criteria for prevention, treatment and rehabilitation. It examines and implements new methods of preventive care, diagnosis, treatment and physical and balneological rehabilitation. It conducts professional training and specialization of sub-specialization of employees and associates. As a health facility owned by the state, by the decision of the Ministry of Health, Institute of Public Health and the Ministry of Mining and Energy, it is an institution that cares about control, exploration of mineral water, exploitation and use of thermo-mineral and mineral water for medical, therapeutic purposes. The institution is legally obliged to control regularly the physical properties of thermo-mineral and mineral water, microbiological, chemical composition,

spring protection and application in balneological purposes [Borović-Dimić, 2001]. Therapeutic balneotherapy cabinets are: underwater massages, baths, inhalations, vaginal spraying, duodenal tubing, electrotherapy, magnetic therapy and manual massage. Special hospital bears the name Special Hospital 'Merkur'. It gained its place on the market in the year of 2005, with opening of the Wellness center 'Fons Romanus'. However, since the interest of visitors exceeded center capabilities, the company introduced new facilities. It opened a new fitness center, sauna and tepidarium. It also opened the clinic for aesthetic and reconstructive surgery, a new mini-operating room that allows more demanding interventions in this field has been equipped.

The future status of the springs

Regarding the expectations of the future status of ownership of mineral and thermo-mineral waters and the influence on socio-economical development of Vrnjacka Spa, a questionnaire was conducted among local residents. Hundred of respondents have been selected according to the following criteria. All respondents live in spa Vrnjacka Spa. They were aged between 20 and 65. Half of the respondents were women. The subjects were of different degrees of education and economic power, and also of different business dependence of the mineral sources.

According to the Strategy of development of tourism in Serbia, there are three scenarios of the future use of mineral and thermo-mineral water of Vrnjacka Spa [VRS, 2006]. According to them, a common starting point is that defining the owner of the spring is imperative; otherwise it will continue to lose large amounts of water due to the difficulty of management of springs. Inadequate maintenance of water springs, which has been present until now, can only continue to have negative impact on their design and utilization. The first or 'the worst' scenario is that by which springs could be transferred or sold to entrepreneurs from abroad, which will only bottle the water and sell it. Interdict of access to visitors and citizens lose the sense of existence of the spa. In the second scenario, the water would be partially transferred, and access to springs would be available to everyone but for a fee. In the third scenario the mineral and thermo-mineral waters would remain the property of the state of Serbia, with unlimited access to mineral springs. In that case, its management must resort to reengineering and must, in function of sustainability, raise the level of responsibility in all aspects of the use of this natural treasure.

The following results were obtained from the survey. Mineral waters are very important for the existence and survival of the settlements to those respondents who are employed in health care facilities, restaurants, hotels, industrial buildings, which process and bottle the mineral water, institutions of culture and administration. Most (75 %) of the local population of Vrnjci thought that regional development depended on the mineral and thermo-mineral waters (Graph 2). About 23% of respondents did not achieve any income by working in jobs that directly or indirectly are associated with the presence of mineral and thermo-mineral waters in the Spa. They stressed that them it is not of crucial importance, but they are aware of its importance due to activities carried out by members of their families, neighbors and acquaintances, which depend on the mineral and thermo-mineral springs. Most of the respondents 86 % agrees that the presence of this natural resource in the past influenced a lot the development of settlements, i.e. micro-region, especially after the World War II. Most respondents (91 %) believe that the mineral and thermo-mineral waters were not used enough in the past. They note that even today in some springs the water flows out freely, and that it should be regulated as soon as possible. About 18 % of respondents believe that the problem can be solved in the way that Vrnjacka Spa springs should be privatized. However, the majority of population of Vrnjci (71 %) still believes that the springs in Vrnjci should not be privatized (Graph 3). Almost ¾ of respondents (73 %) says, if privatization is inevitable, they would like to privatize a minority of the springs. Most of the population of Vrnjci (68 %) thinks that the future of Vrnjacka Spa depends on the future owner of mineral springs (Graph 4). About half, the 56 %, prefers the future owner to be the citizen of Serbia. More than two-thirds, 62 % of respondents are afraid that the future owner of the spring could reduce the purpose of the spring, i.e. to use it only for bottling, which would jeopardize the benefits that they provide to tourists and citizens of the micro-region: 'Hotels would then remain empty, capacity in private facilities would remain empty, restaurants would be closed, medical facilities would be without patients, spa bath would be without its users, shops and other service industries would be reduced to the needs of residents of settlements, Secondary school of Tourism would be left without students, and teachers would lose their jobs and so on.' They admit they are not sufficiently informed about all the possibilities of exploiting these waters, and that even they themselves did not use enough, but are

aware of their healing effect. Development of micro-region largely depends on the way of exploitation and conservation, i.e. quality of mineral and thermo-mineral water of Vrnjacka Spa. There are different views of development perspectives. Generally they are differed on the positive and optimist views of young people and other, which belong to elder respondents.

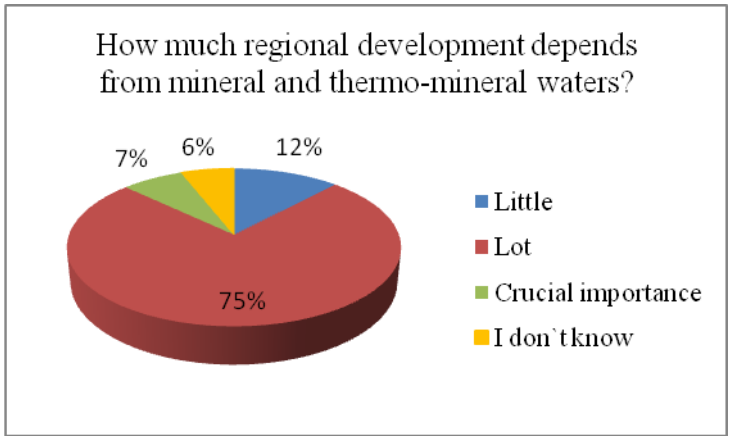

Figure 2. How much regional development depends from mineral and thermomineral waters?

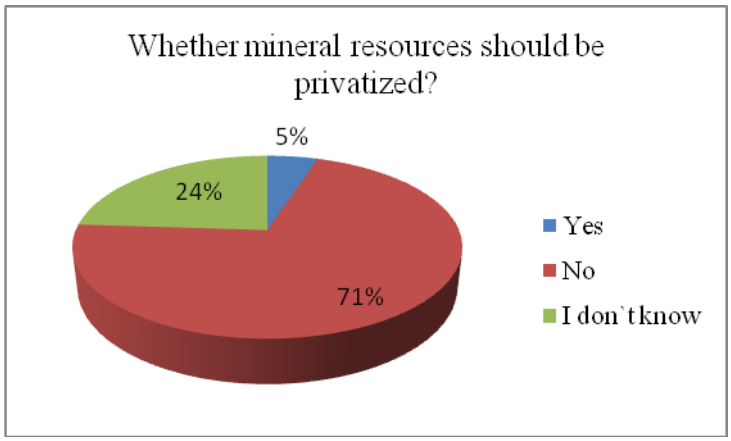

Figure 3. Whether mineral resources should be privatized?

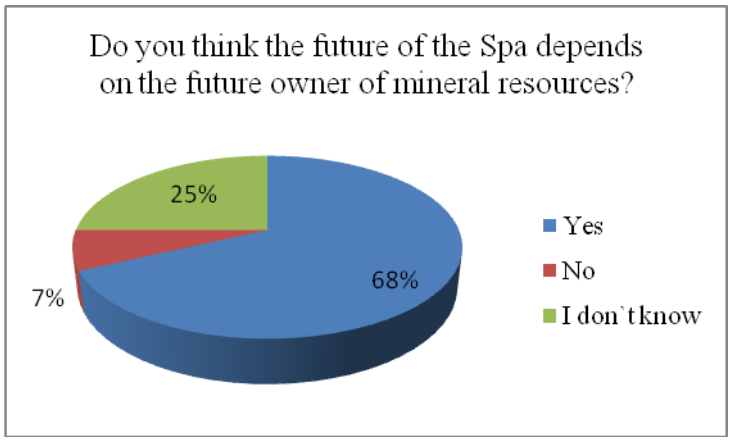

Figure 4. Do you think the future of the Spa depends on the future owner of mineral resources?

Conclusions

Exploration and exploitation of mineral and thermo-mineral springs in Vrnjacka Spa through the entire 20th century was of utmost importance for its development. Depending on the political situation and time, it depended in which direction the development would take place. Before the World War I 'the foundations of development were placed' in such way that researches and testing of mineral and thermo-mineral springs started. Between the two World Wars, researches continued, but their healing properties attracted a rich layer of Serbian population and by the construction of hotels and villas for holiday it positively affected the development of the physiognomy of the village. After the World War II, investments in the construction and equipping of health facilities and accommodation facilities were made. The state financially supported the construction of large hotels and entrepreneurial initiatives of the local population in terms of increasing the accommodation capacity and raising their quality. There was the support of the State also in the issue of water bottling and distribution, which was accompanied by considerable publicity support. Since the last decade of the 20th century, great energy has been directed into research and finding of new sources, which will bring new supplies of water, which is planned for multipurpose use. The richness of Vrnjacka Spa in geothermal energy is used for water supply and treatment. The problem of unused water of hot springs, which daily flows into the disappearance, can be solved if it is put in function of heating greenhouses, water supply of swimming pools in spa hotels and as technical water. Water from the spring Topla voda (36.6°C), spring with the highest temperature compared to other springs of Vrnjacka Spa, can be used for heating of residential and commercial, industrial, recreational, storage and similar facilities. Excess water of hypothermal springs could be used in process of production of healthy food and fish farming. Vrnjacka Spa has modest energy potential, but sufficient and very important for the sustainability of its local development. Preservation of springs, Vrnjacka Spa, and the other spas in Serbia, could in future be of great importance in solving water supply problems. For the actual question of ownership over the springs it is necessary to choose such a solution which will satisfy both the interests of local population and the state. Exploration and exploitation of mineral and thermo-mineral water of Vrnjacka Spa stays in the function of development, but its intensity will always be under the influence of various external factors, among which dominate political and economic situation.

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17-Year Periods of Rising and Falling Water Levels in the Kazakhstan Section of the Caspian Sea

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Abstract. The Caspian is the largest endorheic lake on Earth, situated on the boundary of Europe and Asia, yet it is called a sea due to its sheer size and its seabed that has been formed by oceanic Earth crust. The Caspian Sea has a fluctuating hydrologic regime that causes both sharp drops and sudden increases in its water level. The present article examines the specifics of the relief of the sea floor in the Kazakhstan section of the Northern Caspian which is the most susceptible to underflooding (due to a rise in the water table) during water surges. This article analyses the dynamics of the fluctuating water levels in the Caspian Sea during the period of decreased and increased water levels from 1960 to 2013. It also offers the possible reasons for these changes in the water levels of the Caspian Sea.

Keywords: Caspian, endorheic sea-lake, seal, sturgeon, beluga, oil, terrain and sloping of the seabed, dikes, sand bars, banks, rift, hydrologic regime, unstable level, amplitude, water surge, salt lakes, Kaydak, Olikoltyk, increase and decrease dynamics, tributary, evaporation, precipitation, forecasts, causes for fluctuation.

Introduction.

The Caspian Sea is the largest endorheic lake on Earth, but it is called a sea due to its sheer size, saline water and its demeanour that resembles a sea. The sea was named in the middle of the 16th century after the Caspian people that lived in the Transcaucasian region. There is still a city called Caspi that remains in Georgia today. The sea has also been called Hyrcanian Ocean (1st century), Khazar Sea (2nd-10th centuries), Khvalyn or Khvalis Sea (10th-12th centuries) and has had over 60 other names given to it by the people who have lived here over the last 3,000 years. The Caspian Sea separated from the Black Sea due to a rise in the earth's crust at the end of the Neogene period, which is considered to be the period when the sea was formed. The Caspian Sea has an area of 370,000km², which is over four times the size of the largest freshwater lake – Lake

Superior in North America. The Caspian holds 78,600km^3 of water while its average and maximum depths are 208 and 1,025 metres, respectively. The surface of the Caspian Sea is 26.5 metres below the level of the ocean according to the Baltic Elevation System (BES).

The endorheic Caspian Lake is more similar to a sea due to its water quality and, correspondingly, the wildlife and plants that are found here. For example, it contains jellyfish that are usually found only in the sea. This is no accident, either. In times long past, the Caspian, Black and the Mediterranean Seas were part of a single large body of water, the so-called Tethys Sea. It existed during the era of the Dinosaurs and it occupied most of Eastern Europe 50 million years ago. The Tethys Sea subsequently significantly decreased in size, having been separated into a host of smaller water bodies that exist even today. Over the last 30 million years, the Caspian Sea has lost and regained its connection to the world ocean several times. Its salinity changed often, which, of course, affected the surrounding biosphere. There are presently many endemic species here, that is, species that are only found inside very limited local territories. For example, a unique animal inhabits these parts – the Caspian seal (seals are usually found only in the circumpolar latitudes). Meanwhile, the sea is rich in fish while its bed and shores are a source of oil and gas. The water body's most distinctive feature, however, is its unstable water level, characterised by sudden rises and falls. Recently, an increasingly alarming question has been, "Why is the water level in the Caspian Sea decreasing?" From 1929 until 1978, the level of the Caspian Sea has decreased from -26.0 to -29.0 metres BES (Baltic Elevation System) above sea level [1,4,14]. This resulted in the Caspian Sea dramatically decreasing in size (in 1929, it had an area of 420,000km^2). This alarmed many scientists, some of whom even began to develop projects to shift the flows of several rivers. However, in 1978, the decrease in the water level suddenly changed to an increase, a large territory was submerged under water, yet the previous levels were still never reached. "Are people at fault here?" and "Is there a reason to worry?" are both questions still cause heated discussions today. The water levels in the Caspian Sea are very unstable, a trend that will continue in the future.

Materials and Methods.

The majority of the factual evidence utilised in this paper has been taken from monthly data pertaining to the levels of the Caspian Sea that has been gathered over many years at marine hydrological stations in Mangystau Oblast, it also includes archival and published materials as well as results of research conducted personally by the authors. Research methods – theoretical analysis of the long-term data regarding the dynamics of the water levels in the Caspian Sea during the periods of high and low levels between 1960 and 2013 and the assessment of the forecasted variability of the fluctuations. Information is presented in the form of a satellite image, charts, graphs and tables that include standard parameters.

Discussion.

Over the last half a million years, the sea's height has fluctuated between -140 and +50 metres above sea level, and it even regained its connection to the Black Sea several times. It is thus considered that the Caspian Sea has been studied fairly well, however, there are still numerous unsolved mysteries in its "marine" behaviour [1,3,5,6]. The Caspian Sea stretches in the meridional direction from north to south over 1,200km and is situated between 36°33N and 47°07N and 45°43E and 54°03E. At its maximum, its width is 435 kilometres while its average width is 310 kilometres. The Caspian Sea has a shoreline spanning 7,000km, while its waters border on Russia, Kazakhstan, Turkmenistan, Azerbaijan and Iran. The Kazakhstan Republic has 29 % of the shoreline (2,340km), Turkmenistan – 21 %, Azerbaijan – 2 %, Russia – 16 % and Iran – 14 %. Mangystau Oblast holds 1,399.5km of the Caspian Sea shoreline.

The terrain of the Caspian Sea basin is divided into three physical regions – Northern, Middle and Southern Caspian, which are divided by the Mangyshlak and the Apsheron Thresholds, respectively. The boundary of the Northern Caspian lies along the Mangyshlak Threshold, whose terrain consists of an array of shallows and depositional islands, situated on the extension of the Tiub-Karagan Cape. The middle region spans from the Tiub-Karagan Cape to the Apsheron Threshold Cape, while the rest of the sea is the Southern Caspian. The northern region is shallow, with average depths reaching only 5-6 metres while the maximum depths of 15m-20m are mostly found on the border with the middle region (lines A-B and C-D on Diagram 1). This section of the Caspian Sea covers 24 % of the total area. The middle region, with an average depth of 200m and a maximum depth of 788m, covers 36 % of the total area. The southern region is the deepest with an

average depth of 345 *m*, a maximum depth of 1,025m and covers 40 % of the total area. Our Republic of Kazakhstan borders on the fairly shallow parts of the Northern and Middle Caspian. There are not many islands in the Caspian Sea and they cover a total area of 2,045 km^2, yet 88 % of them are located in the Kazakhstan territory. The largest are Kulaly Island and Morskoy Island with an area of 73 km^2 and 65 km^2, respectively, and they are situated in the Tyuleniy Archipelago. On its eastern shores, the Caspian has several large capes such as Mangystau and Tiub-Karagan Cape as well as Buzachi (Diagram 1). The Caspian Sea is situated within two climate zones. In the north, it is nestled between the severe and the moderate continental climates of the temperate zone, the south-west is within a subtropical climate, while to the west there is the desert continental climate of Central Asia. In the summer time, the surface of the sea becomes very hot and, despite the sea covering a long area from north to south, the temperature remains fairly uniform throughout at +24°C, +26°C. Temperatures in the winter vary significantly. The winter is cold in the north with the average temperature in January being anywhere from -7°C to -11°C. In the middle section, +1°C to +5°C, in the south, +8°C to +10°C. Overall, winter on the eastern shores along the entire span of the sea is colder than on the western shores. In the winter, storm winds rage along the Caspian, blowing from Kazakhstan, while the northern section of the sea up to the line between the Chechen Island and Tiub-Karagan Cape, considered the boundary between the Northern and Middle Caspian, is covered with ice in December. The North Winds carry this floating ice far to the south.

It should be noted that this study examines the North-Eastern shores of the sea – the section of the Caspian Depression located within the borders of Mangystau Oblast, as the region that is most sensitive towards the sea's fluctuating water levels due to its shallow nature. The general features of the terrain of the Caspian Sea bed in its Kazakhstan section are characterised by the large geotectonic structures of the region, which are responsible for the division of the Caspian Sea into the Northern and Middle Caspian along the Mangyshlak Threshold. The northern section of the territory under examination is part of the Caspian Depression of the Pre-Palaeozoic Russian shelf and is closely interconnected with the geological and the geomorphological structures on the adjacent dry land. Primary landforms, created by salt tectonics, are eroded through abrasion, which includes the accumulative activities of currents, waves and water surges. The Northern Caspian Shelf is generally characterised by a gentle slope and weak stratification, with depths not exceeding 10 metres. There are several types of underwater depositional plains: marine, of a complex origin with islands and shallows, as well as the sloped plain of the underwater shore declination. The development of the terrain on the shores of the Northern Caspian, which are part of the Caspian Depression, is greatly affected by the fluctuations of the water level in the sea – the water surges. Large depositional landforms have been created within the coastal plain, which was itself created by currents and waves: shallows, dikes, sand bars and banks, especially in the eastern section [4, 7].

The specific geomorphological features that characterise the Northern Caspian take the form of a depression created by erosion and tectonic movement, the Ural and Mangystau Rifts. The terrain of the Northern section of the Caspian is a shallow, wavy plain. The terrain of the seabed particular to the section of the Caspian Sea under examination includes the following geomorphological regions, which will be further described in the present article:

– The region of the Northern Caspian located to the north from the line between Lake Chechen (43°57̇58.60̇'N, 47°4459.06'E) and Tiub-Karagan Cape (44°3536'N, 50°165'E), which is the conventional boundary between the Northern and Middle Caspian (Diagram 1)

– The region of the Mangyshlak Threshold, which is a natural boundary between the Northern and Middle Caspian.

The northern Caspian is characterised by depths from 1m to 6m and is a fairly flat and gently sloping plain with a stepped structure (Diagram 2). It also inclines towards the middle of the sea along the A-B line for 200km. The terrain of the seabed towards the Buzachi peninsula is more of a low-angle incline; however, there is a sudden drop towards the centre of this line, making this region especially susceptible to flooding during water surges (Diagram 3). This region can be considered the flooded section of the Caspian Depression.

Figure 1. A satellite image with the lines showing the seabed profile of the Northern Caspian, using the ArcGIS 9

The maximum depth does not exceed 26m, while 70 % of the area has a depth of 6m. At the present time, the recently dry salt lakes have transformed into moist salt lakes, which includes large lakes such as Olikoltyk and Kaydak. On the opposite side at point A is the newest step – Volga's delta front – which rests on a fairly small shelf ledge that is 2 metres tall. The shallowest points have been recorded at the top of a small swell-like projection of the seabed on the east side of the basin, while the maximum has been recorded in a small local depression in the south-eastern part of the basin. Overall, the depths vary in a diagonal pattern from the north-western corner of the basin to its south-eastern corner. In the north-western regions, the sea is 1m-6m deep, while the basin's depths gradually increase towards its south-eastern section. The overall length of the C-D line that shows the seabed profile is 150km. The 100km section of the Caspian Sea from the Tiub-Karagan Cape to the Chechen Island has a seabed profile comprised of dikes and sand bars whose highest point is located at a depth of 6m, while their deepest, on one straight line, is roughly at 10m (Diagram 2). For the other 50km until the (Caspian) Lagan Island, until point C, the crooked seabed profile suddenly drops from 6m to 17m from the surface of the water, which is like a "ramp" for the surging waters. Lagan (45°4916.1 ˈN, 48°3612.7 ˈE) was founded in 1870 as a settlement for those moving from Russia to the Caspian.

In 1944, during the deportation of Kalmyk people it was renamed to Caspiyskiy, was made a city in 1963 and in 1991 it was renamed back to Lagan. The sea has since receded and the city is presently located 9km away from the shore. The rise in water levels from 1978 to 1995 was not only unexpected, but also led to a number of negative consequences [8,11]. The zones that were flooded and subject to waterlogging were very extensive, especially in the northern (plains) section of Dagestan, in Kalmykia and Astrakhan Oblast. The rise of the water level affected the cities of Derbent, Caspiysk, Makhachkala, Sulak, Caspiyskiy (Lagan) and dozens of other smaller communities. In our Kazakhstan section of the Caspian Sea, the area that was affected by the waterlogging within the Buzachi peninsula is the location of functioning oil and gas deposits Komsomolskoye, Kalamkas, Karazhanbas and Arman. Although they are protected by dams made from local rocky soils, these dams are very permeable and rather susceptible to abrasion and erosion.

As for the residential areas, the most at risk for flooding and waterlogging are the Bautino Township, Fort Shevchenko and sections of Mangystau Oblast regional centre, the city of Aktau. In this respect, the issue of water and soil contamination by oil and gas is a very pressing issue for the coastal areas around the Caspian Sea where the flooded drilling holes are located. [13].

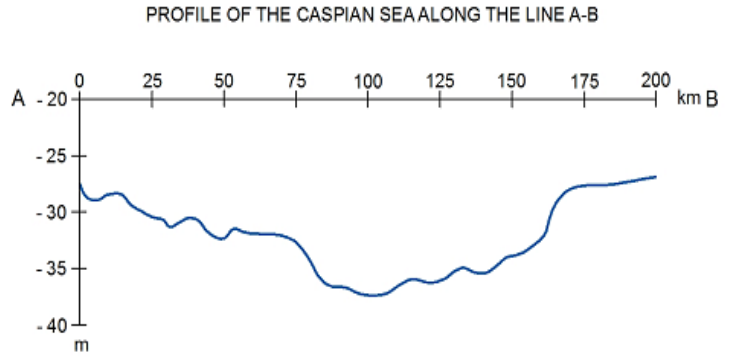

Figure 2. Seabed profile of the Caspian Sea along the A-B line

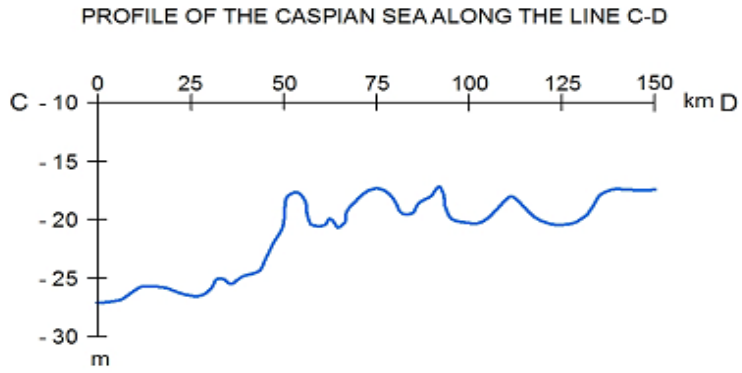

Figure 3. Seabed profile of the Caspian Sea along the C-D line

The fluctuations in the water levels have raised a number of issues, the most important of which is recovering and maintaining the commercial fishing importance of the Caspian Sea. To resolve these issues, it is necessary to determine the reasons for the decreases in the water level and to study the water balance. In this respect, the specifics of the water level fluctuations in the Caspian Sea, which are accompanied by sudden water level decreases and increases that last for various period of time, undoubtedly present a scientific interest.

The reasons for the water level fluctuations have not yet been ascertained, although there are speculations that they could be connected to the fluctuations in the river flow, the deformation of the seabed, an influx of water from beneath the earth or due to climate change. Geologic and paleogeographic research allows us to look into the distant past of this region. Over the last 10,000 years, the level of the Caspian Sea, situated lower than the level of the world ocean, has fluctuated

between -20 and -40 metres. It is enough to note that the sea's water level in the 4th-2nd centuries B.C. was no higher than -36m, in the 6th century it was at the absolute marker of -34m, in the 10th century it was at -29m, at the beginning of the 14th century at -19m, while at the present time it is roughly at -27m. For researching the fluctuations of the water level as early as in 1829, Heinrich Friedrich Emil Lenz proposed to install a depth gauge in Baku, which has since provided the longest series of observations on the matter [5,6,8]. The analysis of the reconstructed water levels in the Holocene (10,000 years), Historical (2,500-3,000 years) and the Instrumental (1835-2003) periods (according to Rudolph Klige, 1994) allowed the authors to define the maximum, average and the minimal points in the fluctuating water levels of the Caspian Sea. The amplitude of the fluctuation of the water levels in the Instrumental period is based on data collected by hydrological stations and is 3.8m, with an average of 2.3m (Table 1). There are 8 functioning hydrological stations in Mangystau Oblast (Fetisovo, Kalamkas, Saura, Khazar, Mys Peschanyy, Aktau weather station, Fort Shevchenko and Kulaly), each of which take measurements of the sea four times daily. At 00, 06, 12 and 18 hours, the stations measure the water level, the height and the direction of the waves, the temperature of the water and its salinity, the condition and the location of any freezing, the thickness of the ice, wind direction and speed, the amount of precipitation and the clarity of the water [1,2,4].

Table 1. The amplitudes of the fluctuation in the water levels of the Caspian Sea (*m*)

Water level	Periods		
	Holocene (10,000 years)	Historical (2,500-3,000 years)	Instrumental (1835-2003)
Maximum	- 9	- 20	- 25,2
Average	- 25	- 27	- 26,6
Minimum	- 34	- 34	- 29
Amplitude of the fluctuations	25 (0.35 cm/year)	14 (0.55 cm/year)	3,8 (2,3 cm/year)

The analysis of these observations made by those researching these issues allowed the authors to establish that from 1850, the fluctuations in the water levels had a cyclical character, however, since 1869 the levels of the water has been steadily decreasing. At the beginning of the 20th century, the water level was fairly stable. Then the water level suddenly dropped by 1.9m from 1929 to 1941. By 1956, the water level was 2.5m lower than it had been in 1929. Between 1956 and 1960, the water level had somewhat stabilised [3, 7, 9]. The fluctuations in the water level of the Caspian Sea within Mangystau Oblast of the Republic of Kazakhstan from 1960 to 2013 have been put together from data provided by Kazhydromet and are shown in Diagrams 4, 5 and 6.

Compared with 1960, in 1962 the water level had dropped by 28cm while in 1964 it increased by 14cm. The water level was at -28.27m in 1966, which is 3cm lower than the water level in 1960 at -28.23 BES. Between 1966 and 1969, the water level dropped by 22cm, then by 1970 the water level had increased by 14cm. From 1970, the water level began to decrease again. As such, the water level in 1973 had decreased by 25cm, and remained stable throughout the year. Since 1974, there has been an observable sudden drop in the water level amounting to 1.4m, which reached the lowest point for the current century in 1977 at -29.0m BES. This was the final year in a 17-year period of decreasing water levels in the Caspian Sea from 1960-1977 (Diagram 4) [1, 2].

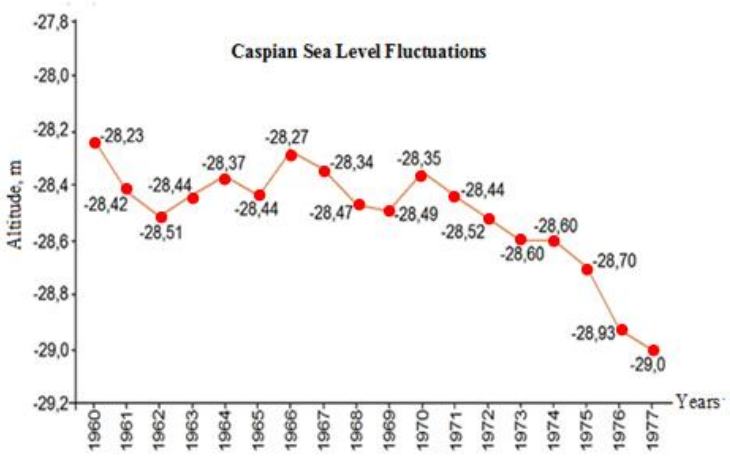

Figure 4. The fluctuations (decrease) in the water level of the Caspian Sea in Mangystau Oblast for 1960-1977 (Kazhydromet)

In the second half of the 1970s, the decrease in the water levels had a more gradual character than in the 1930s-1940s. It then slowed and even stopped, and from 1978 the Caspian Sea had even began to rise (Diagram 5). As such, in 1978, the sea level was at the -28.95 marker, which is just 5cm more than in 1977. In 1980 the water level reached the -28.48 marker, that is, in just two years from the beginning of the increasing water levels, the sea had increased by 47 *cm*. By 1985, the level of the water in the Caspian Sea had risen 80cm and flooded the coastal area around the Buzachi peninsula and the Tiub-Karagan Cape, while also flooding 50-55km of the large bay-salt flats Olikoltyk and Kaydak, which had previously dried up due to the lower water levels. This led to an increase in the area of the shallows and, as a result, increased the amount of evaporation (to 10km^3/year). This high water level also increased the outflow of water into Garabogazköl. This water rise did not cease in the subsequent years. Over the next ten years in the 1990s, the water levels increased by almost an entire metre and pushed the sea levels up to -27.53 *m* (95 *cm*). This process did not just create various environmental and economic issues related to the subsequent flooding, but it also brought new mysteries for scientists to research. Could this possibly be a new marine transgression or one of those small accidental increases that have happened numerous times over the previous decades? In 1995, the water level was at -26.62 *m*, a 91 *cm* increase over 5 years. From 1978 to 1995, the water level had increased by a total of 2.33 *m*. In terms of annual change, the maximum water levels are found in July and August while the minimums are in February. The water fluctuates by 29-34 *cm* within a given year. It is also necessary to note that if the water in the rivers that flow into the Caspian Sea would not be removed at a rate of 40 *km*^{3}, which is practically 40 billion cubic metres of water, for day to day needs and irrigation (which equals to 10cm of sea level), then this level of -26.62 BES would be 1.5 metres higher and would be close to the 160-year record high mark of the last century (Diagram 5). Therefore, in the present case, 1995 ends another 17-year cycle from 1978-1995, a cycle of increasing water levels in the Caspian Sea (Diagram 5). In 1996, the water levels dropped by 17cm from -26.62m to -26.79m BES. This year begins the third cycle since 1960, but this cycle will be of decreasing water levels [1,15].

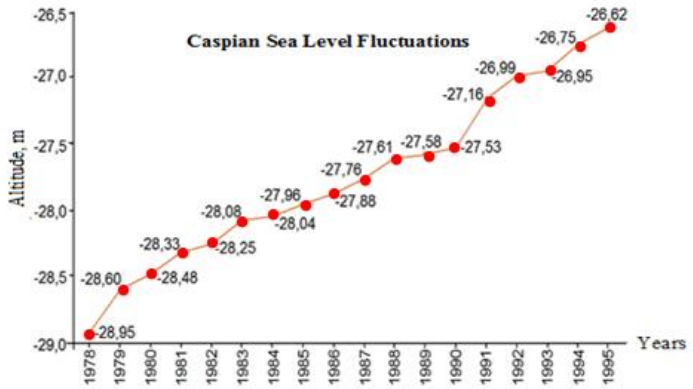

Figure 5. The fluctuations (increase) in the water level of the Caspian Sea in Mangystau Oblast for 1960-1977 (Kazhydromet)

In the subsequent years following 1996, there has been an observable annual decrease in the water level until 2001, when the sea had reached a marker of -27.17 *m*, a 38 *cm* decrease (Diagrams 6,7). However, in 2005, the water level increased once again by 26 *cm* up to the marker of -26.91 *m*. In 2006-2007, the water level was at -27.04 *m* with a decrease of 7 *cm* as compared with 2005. According to the data gathered by National Hydrometeorology Organisations in the nations surrounding the Caspian Sea, there was an abnormal seasonal decrease in the Caspian Sea water level in the second half of 2010, a decrease that was 1.5 times greater than the average markers over the last 50 years. After the flow of the Volga River was regulated in the middle of the last century, a majority of the stations located on the coast of the Caspian Sea noted that seasonal decrease in the water levels of the sea was an average of 15-19 *cm*. From July to October of 2010, however, the water level on the Western shore of the Middle Caspian, in the area of the city of Makhachkala, decreased by 30 *cm* (data from Roshydromet), while on the Eastern shores around Aktau city, water levels decreased by 31cm in July (data by the Kazhydromet (Diagram 6)). The levels of the seasonal water level decreases in 2010 were significantly higher than the average between 1961 and 2009.

The Azerbaijani coast of the Southern Caspian Sea (data from Azhydromet (Azerbaijan HydroMet)) saw the water levels decrease by 32cm from June to October, while the Iranian shores saw a decrease of 31 *cm*, according to data provided by the National Research Centre. In our Western Kazakhstan section of the Northern Caspian around the Tyuleniy Island, the seasonal decrease in water levels amounted to 32 *cm*, while in the Eastern section (Kulaly Island) it was 44 *cm* according to data provided by Kazhydromet. The reason for the sudden decrease in the water levels, as compared to the last five year, is the abnormally hot and dry summer in Mangystau Oblast, as well as the decreased water levels in the Volga. Within these conditions, only a third of the usual amount of summer precipitation was recorded on the Western shores of the Middle Caspian around Mangystau Oblast, while the average temperature was 3.5 degrees lower than the norm. Meanwhile, the water flow in the Volga was 35 km^3 lower than usual over the first nine months, according to Roshydromet [5,11,12]

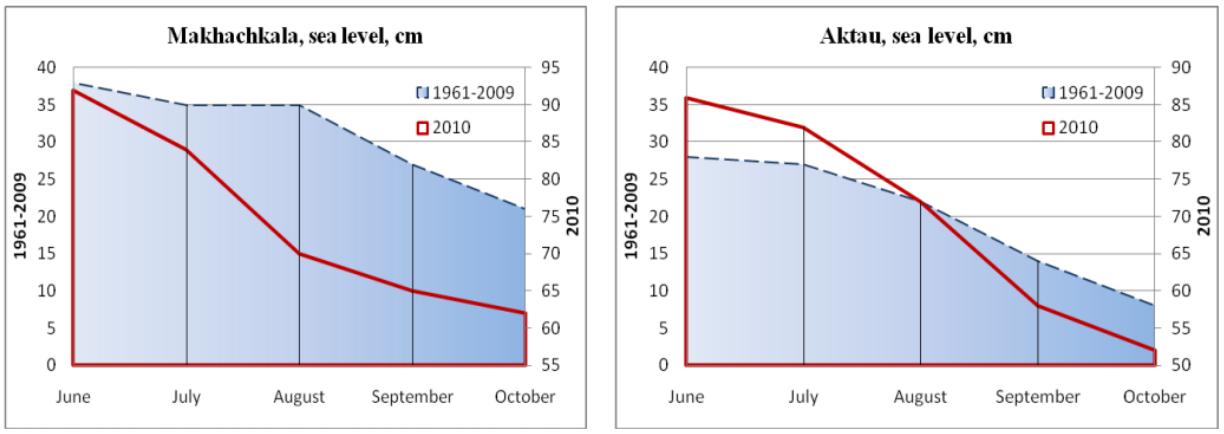

Figure 6. The seasonal decrease in the Middle Caspian water levels for 2010 on the Western and Eastern shores, as compared with the long-term data recorded at the Makhachkala and Aktau stations.

Specialists from the Coordinating Committee on Hydrometeorology and Pollution Monitoring of the Caspian Sea consider the sudden seasonal decrease of the water level in 2010 by 25 *cm* (from -27.25 *m* to -27.50 *m*) to prove their hypothesis regarding the fact that the sea level will be a minimum of 15-20 *cm* lower in the middle of 2011 than it was in 2010 (Diagram 7). With a high probability, it is expected that in 2012 the water level will continue to decrease and will fall by a further 10-15 *cm*, and any changes in the fluctuation tendencies of the Caspian Sea would only be noted in 2013. According to data available in the General Catalogue of the water levels in Caspian Sea, the levels at which the water has decreased in the sea have increased since the beginning of the century. In 2010, the level of the sea decreased by 9 *cm*, while in 2011 – by 25 *cm*. For the region studied in this paper, the sea levels in 2009 amounted to -27.19 *m*, while in 2010 they were at -27.25 *m* with a decrease of 6cm and in 2011 they were at -27.50 *m* – a sudden drop (Diagram 7). The Federal Service for Hydrometeorology and Environmental Monitoring of Russia had forecasted that the tendency in the decreasing levels of the sea would continue in 2012 with the sea levels decreasing by 10-15 *cm*. The Coordinating Committee has forecasted a 13 *cm* decrease and proposed that the main reason for the decreasing water levels in the Caspian Sea is the lower water flows in the Volga River. It is true that the water flow in the Volga was overall lower than normal in 2012 and reached before unseen levels at the top of the delta, equal to 25 km^3. This led to the levels of the seasonal decrease in the water levels over the second half of 2012 to be lower than in the previous two years [13]. In 2010, the water level fell by 6cm per month in the second half of the year, in 2011 – by 5 *cm*, while in 2012 – by 4 *cm*. According to monthly data collected at the hydrological stations at Kalamkas, Kulaly, Fort Shevchenko, Aktau, Saura and Mys Peschanyy, located around the entire coastline of Mangystau Oblast, the speed of the seasonal drop in the water levels in the second half of 2012 fluctuated with a 3 *cm* to 9 *cm* average absolute value (4.5 *cm/month*), the speed was 1.5cm more than the average speed of the seasonal increase in water levels for the first half of 2012 (3cm/month). As a result, the average annual level of the sea in 2012 within Mangystau Oblast had decreased by 5cm as compared with 2011 and equalled -27.55 BES.

In December of 2012, the average water level in the Caspian Sea reached the -27.64 *m* marker, while in the 2013, the level was observed to be at -27.61 *m* BES (Diagram 7). At the same time, according to the long-term data found in the General Catalogue of Caspian Sea water levels, the rate of the sea's seasonal increase from January to June is more stable in comparison with the rate of its seasonal decrease from July to December. The seasonal water level increase is usually between 2 *cm* and 4 *cm* per month. Based on this information, the Coordinating Council has suggested that the average water level in 2013 will be between the -27.40 *m* and -27.50 *m* BES absolute markers. Although insignificant, this would have been the water level increase in the last five years. Unfortunately, the proposals and the forecasts turned out to be mistaken. For example, the Kazhydromet (Kazakhstan HydroMet) had made a forecast of the water levels in the sea in their publication *Level of the Caspian Sea in its unfrozen sections for January 16-21, 2014*. They

predicted that water levels in the Central Caspian would be fluctuating around the -27.68m mark, reaching a maximum of -27.40 *m* and a minimum of -27.83 *m* [15]. From January 9 to 15, 2014, the most up-to-date information on the Central Caspian water levels was provided by the following Kazhydromet marine stations and posts: Peshnoy, Zhanbay, Kalamkas, Kulaly and the Roshydromet station on Tyuleniy Island, whereby the average water levels equalled -27.65 *m*. According to the most up-to-date data provided by the following Kazhydromet marine stations and posts: Fort Shevchenko, Aktau, Fetisovo and the Roshydromet in Makhachkala, the average water level in the sea's deeper sections amounted to -27.70 *m*, with a maximum of -27.47 *m* and a minimum of -27.81 *m*.

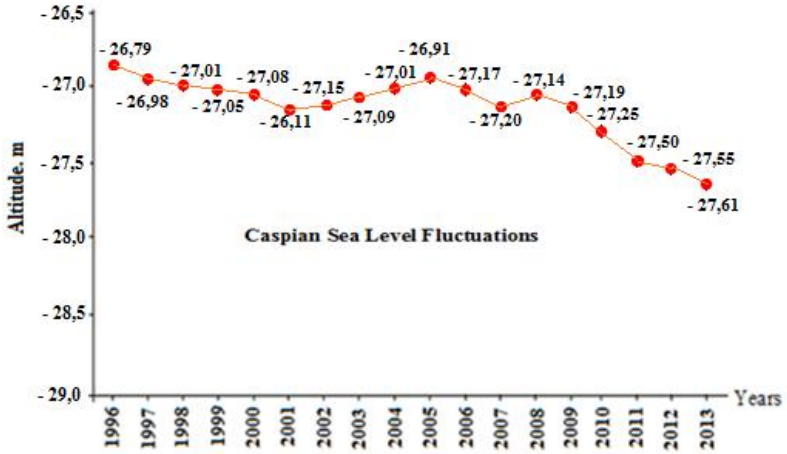

Figure 7. The fluctuations (decrease) in the water level of the Caspian Sea in Mangystau Oblast for 1960-1977 (Kazhydromet)

Because this study does not intend to provide an in-depth analysis of numerous forecasts for the fluctuations in the water levels of the Caspian Sea, it will instead offer a hypothesis from assessing the results of these analyses below. As such, there has currently not been a single successful forecast. This is due to the fact that forecasts have various approaches (deterministic and probabilistic). Deterministic forecasts rely on the levels of the sea's water balance. In this respect, the insufficiently developed theory and practice of long-term forecasts surrounding climate change, along with the fluctuations of water levels in a sea spanning large territories, hinder the usage of deterministic forecasts. Between 1995-2005-2008, when the water level began to rise, a majority of the forecasts suggested that, especially in 1996, the sea would continue an almost linear accelerating increase up to -25.0m BES. However, these forecasts did not take into account the following circumstances. Firstly, the intermittent nature of the fluctuation of water levels in endorheic basins like the Caspian Sea. This also includes the instability of the water levels in the Caspian Sea, as well as its intermittent nature, which are confirmed through analysing past and present fluctuations. Secondly, when the water levels in the sea were at -26 absolute metres in 1995, this led to flooding of the large bay-salt lakes on the north-eastern shores of the Caspian Sea – the Mertvyy Kultuk and Kaydak, which had previously dried up due to the lower water levels, also flooding lowland territories in other locations around the shoreline. This increased the area of the shallows and, as a result, increased the amount of evaporation (to 10 *km³/year*). Additionally, the increased water levels also increased the outflow of water into Garabogazköl, which slowed the rate of water level increase in the Caspian Sea. Finally, fluctuations of the water levels in the sea within the modern climatic environment (the last 2,000 years) are higher, but limited by the risk zone (from -30 to -25 absolute metres). In this respect, this trend of decreasing water levels will continue until at least 2015. Accounting for the anthropogenic decrease of the outflow into the sea in the nearest 15-17 years, the water levels are unlikely to exceed the -26 to -26.5 absolute metre mark.

As for the main causes of the fluctuations in the Caspian Sea water levels, the authors will offer an analysis of the experiences and the achievements of research that has been conducted on this issue. As early as in 1836, Heinrich Friedrich Emil Lenz, and then subsequently Aleksandr

Voyeykov in 1884, attempted to explain the fluctuating levels of the water in the Caspian Sea for the first time as being the product of various climatic factors, in particular evaporation within the hot climate of Turkmenistan and Mangystau Oblast, while also being influenced by the amount of atmospheric precipitation. At the beginning of the 19th century, hydrologists, oceanologists and scientists studying physical geography maintained and were adamant about the fact that the water level fluctuations depend on the changes in the various components of the water balance [3, 4, 7]. Meanwhile, a majority of the research was based on composing the equation of the water balance and analysing its components. As such, the fluctuations in the volume of water in the sea are the difference between the inflowing waters (river and subterranean) together with atmospheric precipitation on the surface of the sea and the outflowing components (the evaporation from the surface of the sea and the outflow to the Garabogazköl) of the water balance. The fluctuating water levels in the Caspian Sea are the quotient of the fluctuating volume of its waters over the area of the sea. Additionally, the correlation between the inflow of the Volga, Ural, Terek, Sulak, Samur and Kura Rivers and the visible or effective evaporation as well as the difference between the evaporation and atmospheric precipitation on the surface of the sea play a key role in the sea's water balance. It has also been established that the largest contributor (up to 72% of the dispersion) to the fluctuation of the water level is the inflow of river waters, or, more specifically, the flow formation zone in the Volga basin. Many researchers believe that the fluctuations in the flow of the Volga are related to the fluctuations in the atmospheric precipitation in the winter, depending on the atmospheric circulation. Malinin V. N. has proposed that the search for the initial sources of the moisture coming into the Volga basin should start in the North Atlantic or, more specifically, in the Norwegian Sea. The increased evaporation from the surface of the sea there causes the increased amount of moisture in the Volga basin. As such, information regarding the water balance in the Caspian Sea that was obtained by R. E. Nikonova and V. N. Bortnik from the State Oceanographic Institute conclusively proves that the main reasons for the sudden drop in the water levels of the Caspian Sea in the 1930s as well as their abnormal increase in 1978-1995 were caused by changes in the inflow of river water and visible evaporation. Assuming that the inflow of the Volga is the main factor influencing any changes in the water balance of the Caspian Sea, by giving no less than 80 % of the total inflow and around 70 % of the inflowing waters, this raises the question of the connection between the water levels in the sea and the inflow of water provided by the Volga alone. The correlation of these values, however, does not give satisfactory results. However, the connection between the water levels in the sea and the inflow of the Volga can be traced quite accurately while considering the inflow of the river not for a given year, but instead taking the consecutive sum of the standard deviation in the annual values of the inflow from the long-time average annual value (the norm) [7, 8, 10]. Even the visual comparison of the values of the average annual water levels in the Caspian Sea and the differential integral curve of the Volga inflow reveals their similarities. Taking a period of sudden decrease (1929-1941) and increase (1978-1995) in the water levels for analysis, the total correlation coefficient will be 0.987, separately, this value is 0.990 and 0.979 for each period, respectively [11, 13]. The abovementioned calculations completely prove the hypothesis that during periods of sudden decreases or increases in the water levels of the Caspian Sea, the water levels are tightly related to the inflow of water or, more specifically, the sum of its annual deviations from the norm. Forecasts have predicted that from the 1940s, irrecoverable water usage will lead to a decrease in the inflow of all river waters towards the Caspian Sea and the decrease of its water levels as compared to its natural levels. According to V. N. Malinin, by the end of the 1980s, the difference between the actual level of the sea and its reconstructed (natural) level was almost 1.5m. At the same time, the total irrecoverable water used in the Caspian basin was evaluated in those years to be 36-45 *km³/year*, almost 26km³/year of which were taken from the Volga. If the river waters were not extracted, then the water levels in the sea would start increasing not at the end of the 1970s, but at the end of the 1950s. As for assessing the influence that irrecoverable water usage has on the level of the Caspian Sea, it is necessary to note that the forecast of the volumes of water intake and water loss caused by evaporation from the surface of water bodies in the Volga basin are, apparently, significantly overstated. Additionally, another important factor is the possible increase in the water level in accordance to the Archimedes principle, due to the submerging of drilling equipment and entire shelves, artificial islands, concrete caissons and oil refining complexes into the sea, the volumes and areas of which are, at the present time, very difficult to calculate. In accordance with the

abovementioned information, it can be stipulated that 2014 will be the year that begins the new 17-year cycle of water level increase until 2040. At the same time, the fluctuations are expected to increase by 9-11cm and in 2015 the water level should reach -27.50m BES. Meanwhile, the cycles of decreased water levels will last no more than 2-3 years.

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17-летние периоды снижения и повышения уровня в Казахстанской части Каспийского моря

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Аннотация. Каспий – самое большое на Земле бессточное озеро, расположенное на стыке Европы и Азии, называемое морем, из-за своих размеров и ложа сложенного земной корой океанического типа. Каспийское море имеет неустойчивый гидрологический режим, обуславливающий как быстрое падение, так и резкое повышение его уровня. В статье рассмотрены особенности рельефа дна Казахстанской части Северного Каспия, наиболее подверженного риску подтопления при нагонно-сгонных явлениях. Выполнен анализ динамики уровня Каспийского моря, в периоды снижения и повышения за 1960-2013 годы. Приводятся возможные причины колебаний уровня Каспийского моря.

Ключевые слова: Каспи; бессточное море-озеро; тюлень; осетр; белуга; нефть; рельеф и пологость дна; валы; бары; банки, бороздина, гидрологический режим; неустойчивость уровня, амплитуда, нагоны-сгоны; соры; Кайдак, Оликолтык, динамика подъема и спада; приток; испарение; осадки; прогнозы; причины колебаний.

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Factors Influencing the Motivation of Young People When Choosing a City Destination in Europe – a Case Study From Esbjerg (Denmark)

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Abstract. This paper examines the motivation factors which influence young people when choosing city destinations in Europe and aims to show if there are any differences in the decision-making process between Danish and international students. Previous research has taught us that the decision to buy a tourism product is a complex process. Therefore, any kind of differences can be essential in developing appropriate marketing strategies for different market segments. The findings of this study indicate that there are seven major factors for young people when choosing a city destination in Europe. Further analysis shows that there are significant differences among several motivation factors when it comes to Danish and international students. The contribution of this study is its indication towards which factors influence city destination choice among young people which will further enable European cities to develop and promote more appropriate and satisfactory tourism products and services for their young visitors.

Keywords: destination choice; young people; motivation; city destinations; Denmark.

Introduction

The reasons behind choosing a travel destination have been an important area of study in tourism literature for decades. A well known typology for understanding travel motivation is the "push and pull" model (Crompton, 1979). The main concept of this model is the decomposition of an individual's choice of a travel destination into two forces. The first force is the push factor that pushes an individual away from home and attempts to develop a general desire to go somewhere else, without specifying where that may be. The second force is the pull factor that pulls an individual toward a destination due to a region-specific lure, or perceived attractiveness of a destination (Lam and Hsu, 2006).

It is assumed that tourists would like to maximize satisfaction while choosing between a range of destinations, goods and services (Tribe, 2004). The key determinants in the decision-

making process are tourists' preferences and their expenditure budgets (Stabler et al., 2010). From an economic point of view, expenditure budgets are not as hard to analyze as tourists' preferences. Furthermore, the decision-making process is more often analyzed by social psychologists or geographers. These researchers are focused on studies of motivation, tourist segmentation and push and pull factors, while economists study tourists' preferences (Stabler et al., 2010).

There are many factors that influence tourists when they need to make a decision about their holiday and destination. According to Horner and Swarbrooke (2007), these factors can be internal (hobbies and interests, lifestyle, attitudes, past experiences, personality etc.) and external (word-of-mouth, promotions and offers, the climate, availability of suitable products etc.). The understanding and analyzing of the decision-making process is very important for destination marketing and management (Pearce, 2005).

The decision to buy a tourism product is the result of a complex process. Horner and Swarbrooke (2007) describe the process in five phases: travel desire, information collection and evaluation image, travel decision (choice between alternatives), travel preparation and travel experiences and the final phase which is connected to travel satisfaction outcome and evaluation.

Tourism development in cities has been seen as a solution for creating income and jobs in the city area since the 1970s (Law, 1993). There are many reasons why people visit cities, and these are: visiting friends and relatives, business, exhibitions, cultural attractions, sightseeing, entertainment, shopping, evening activities, sports and special events etc. (Law, 1993). In the decision-making process a city can be an alternative for a wide range of tourists' experience expectations. Therefore, it is important for cities to create promotions that communicate the benefits of a visit during the second phase of the decision-making process (Kolb, 2006). The promotion of a city must always focus on the needs and desires of a specific visitor group or segment. There are different means of segmentation:

- demographic (age, income, gender, family status, ethnicity),
- geographic (local, regional, national, international),
- psychographic (relaxation, excitement, nightlife, adventure, romance) and
- usage (traditional tourists, day visitors, business visitors) (Kolb, 2006).

The purpose of this paper is to find out which factors influence young people during the decision-making process and to see if there are any differences between Danish and international students.

The purpose of analyzing tourist motivation and activities is to explore visitors' desire, wants and needs. The analysis results will assist destination developers to understand target markets and improve the products, services and activities arranged to the tourists. Tourist motivation studies are useful in developing products, promotion, and marketing strategies. Destination marketing and development become important issues in both theoretical and practical tourism business. As global tourism markets become more and more competitive, many tourism destinations put efforts on improving quality of their products and services and enhancing the competitiveness.

Literature Review

Each destination offers a variety of products and services to attract tourists. From the destinations' point of view, it is very important to know why tourists choose (or not choose) this destination and how the tourists feel about the place they visited. Analysis of tourist motivation attempts to extend the theoretical and empirical evidence on the causal relationship among the push and pull motivations, satisfaction, and destination loyalty (Yoon & Uysal, 2005).

According to Dellaert, Etterma, and Lindh (1998), tourists' decisions are complex multi-faceted decisions in which the choices for different elements are interrelated and evolve in a decision process over time, and most studies of tourists' travel choice address tourist destination choice as the key element in the travel decision-making process. The decision-making process is influenced by a number of psychological (internal) and non-psychological (external) variables, and consists of a number of different stages that are marked by specific actions. Sirakaya and Woodside (2005) provided a comprehensive qualitative review of the tourist decision-making literature, and integrated the main conceptual and empirical work that has been reported in the tourism literature. According to their analysis, the destination choice set model developed by Um and Crompton (1990) is simpler and more theoretically and methodologically sound than the others in tourism decision research. In this model, a tourist's destination choice is made through a 3-stage sequential and funnel-like process: a composition of awareness set (an initial set of destinations

that a tourist is aware of at any given time), an evoked set (late consideration set), and final destination choice. The evoked set is developed from the awareness set. It consists of various destinations that people actively seek information about for alternatives to best meet their needs. According to the choice set model, the destination should be included in each choice set stage in order to be selected as a final destination. The criteria that affect this process include personal (push) factors, destination attributes (pull factors), and constraints. Crompton and Ankomah (1993) suggested that one might use 2 or 3 criteria to reduce the number of alternatives from the awareness set to the evoked set; otherwise, there could be too many attributes to compare. In addition, Lam and Hsu (2006) mentioned that the complex decision-making process leading to the choice of a travel destination had not been well researched. Past studies related to destination choice mainly focus on identifying important attributes affecting destination choice; professional judgment and factor analysis are the main methods (Goossens, 2000; Heung, Qu, & Chu, 2001; Kim & Prideaux, 2005; Kozak, 2002; Mutinda & Mayaka, 2012). These studies have contributed to identifying many factors; the 5-point (or 7-point) Likert scale was used for rating the importance of each factor, and the factors extracted are arranged in order of decreasing variance, but little has been learned about the relative importance of each one by pairwise comparison. Nicolau and Más (2006) pointed out the choice of tourist destination that distinguishes between various approaches to the definition of tourist destination; they showed an overview of the empirical evidence of destination choice with revealed and stated preference probabilistic models respectively, as demonstrated in Tables 1 and 2 of their paper. Either multinomial logit model or nested multinomial logit model is used to investigate the choice of destination in most of those papers. In addition to the above, the literature of destination choice is centered on the direct impact of destination attributes such as prices and distance (Nicolau & Más, 2006), climate (Hamilton & Lau, 2004), quality and pricing (Goossens, 2000). Furthermore, a number of studies were concerned with identifying pleasure motivations which influence the destination choice; however, empirical choice literature has devoted little attention to the impact of tourist motivations on the selection of destinations (Nicolau & Más, 2006). In this study, destination choice can be conceptualized as a tourist's selection of a destination from a set of alternatives; that selection is determined by various motivational factors.

Determining the factors that influence people's choice of destination is essential in developing appropriate marketing strategies. Age, income, gender, personality, education, cost, distance, nationality, risk, and motivation, etc., are factors that affect one's choice of destination (Hsu et al., 2009). Of these factors, travel motivation has been an important area of study in the tourism literature for decades. As motivation is a dynamic concept, it may vary from one person to another, from one market segment to another, from one destination to another, as well as from one decision-making process to the next (Uysal & Hagan, 1993). It is therefore not surprising that the concept of motivation is considered as an element of market segmentation in tourism in many empirical investigations (Kozak, 2002; Yavuz, Baloglu, & Uysal, 1998; Zhang & Marcussen, 2007). Kozak (2002) gives an analysis of tourist motivations by comparing British and German tourists who have visited Mallorca and Turkey. The analysis uses cross-tabulation, factor analysis and a series of independent t-tests to evaluate quantitative data. The findings show that personal motivation and destination attributes should be used for destination positioning studies. Efforts to understand the factors motivating tourists to visit a particular destination and how likely it is to be different from those of others visiting other destinations could help destination planners to set marketing strategies. It will also help the destination to build a self image for marketing and differentiating its own products and services from those of competing destinations. One popular typology for understanding travel motivation is the "push" and "pull" model by Crompton (1979). The push motivations have been thought useful for explaining the desire for travel while the pull motivations have been thought useful for explaining the actual choice of destination. Crompton drew seven socio-psychological (push) motivations (escape, self-exploration, relaxation, prestige, regression, kinship-enhancement, and social interaction) and two cultural (pull) motivations (novelty and education). Uysal and Jurowski (1994) summarized internal (push) and external (pull) motivators to travel. Internal motivators include desire for escape, rest, relaxation, prestige, health and fitness, adventure, and social interaction. External motivators were based on attractiveness of the destination, including tangible resources (beaches, recreational activities, and cultural attractions), and travelers' perceptions and expectations (novelty, benefit expectations,

and marketing image). In more recent studies, researchers have added shopping as a motivational characteristic of the destination (Hanqin & Lam, 1999; Sirakaya, Uysal, & Yoshioka, 2003). Oh, Uysal, and Weaver (1995) noted good shopping was considered as a pull item, an attribute of the destination. There are still other important factors such as destination image, food, and safety. Milman and Pizam (1995) pointed out that destination image is the visual or mental impression of a place held by the general public. Goossens (2000) discussed in depth the role mental imagery plays in the content of the pull force. Eating is one of the most enjoyable activities that tourists undertake during their holidays (Ryan, 1997). Quan and Wang (2004) found that food can act as either a primary or secondary trip motivation and adds value to the image of a destination. Safety is a major concern for tourists (Middleton, 1994). Heung et al. (2001) found that safety appeared to be the top priority for both Hong Kong and Taiwan travelers.

Travel motivation is a multi-motive dimensional. Tourists often have more than one motive for choosing a certain destination, for example, people can choose one destination with a motive of relaxation in a pleasant safe place combined with visiting a local historical heritage. Motivation is also a dynamic and flexible variable. The design of a motivation list 'must be flexible enough to incorporate individual changes across the life-span and consider the effects of broad cultural force on tourist motivation' (Pearce, 1993). For example, a person may change his travel preferences as he moves through the family life cycle from a single-career person to a more family-oriented person, his motives for choosing destinations may be changed accordingly.

Methodology

In this paper, young people are defined as students between 18 and 35 years old who are currently studying in Esbjerg. We thought that it would be interesting to compare Danish students with international students in order to see if there are any differences regarding factors that influence their decision-making process. Horner & Swarbrooke (2007) argued that there is relatively little research on national and cultural differences in relation to motivators. They further explain that some motivators are universal, although actual behavior will be influenced by the nationality and culture of tourists.

Finally, we focus on cities as destinations so it could be applicable to cities in Eastern Europe that are still trying to attract tourists. The main research question is derived from the following sub-questions: What sectors of the tourism supply are the most important for young people when making a decision about their next city destination in Europe? What do young people prefer? How can cities in developing countries compete with today's well-known city destinations in Europe? In order to see if there are differences between Danish and international students regarding the motives that influence their decisions when choosing city destinations in Europe, we propose the following hypotheses:

Hypothesis 1. There are statistically significant differences in motives of Danish and international students when choosing a city destination in Europe.

The other two hypothesis are derived from the first one:

Hypothesis 2. There are statistically significant differences in motives of students belonging to different age groups.

Hypothesis 3. There are statistically significant differences in motives of students that are based on their gender.

The gathered data was processed and analyzed by using the Statistical Package for Social Sciences (SPSS 19). In order to find out which factors most affect young people in their decision making process, the factor analysis was chosen as a relevant method. In this paper, 21 items were generated and then purified and validated through the factor analysis. For the purposes of this study, items measuring the independent variables were simultaneously subjected to a principal components factor analysis with varimax rotation resulting in a seven factor solution with eigen values greater than 1.0.

In order to test our hypotheses we used several different statistical analyses: t-test for independent samples (Córdoba et al., 2010) and one-way analysis of variance (ANOVA) (Xiaolong et al., 2010; Pârvulescu et al., 2011; Paillisson et al., 2011).

T-test for independent samples is used for comparison of mean values of results and definition of statistical significance of their differences. Independent samples are samples that do not have any correlation after the measurement (Field, 2009). Risk possibility level of 5% and 1% was taken into account in the process of definition of statistical significance of obtained results, whereas limit is based on freedom degrees were interpreted according to t-tables.

1.1. Sample profile

We limited our sample to students between 18 and 35 years old who are currently studying in Esbjerg. Although, the WTO defines youth tourists as being between ages 15 and 29, sometimes the upper age limit is as young as 25 years (Richards & Wilson, 2003). From the 192 respondents that filled out the survey, 128 (67 %) were female and 64 (33 %) were male. Most (65 %) of the respondents were 20-24 years of age, followed by those who are 25-29 years of age (27 %). There were very few people who are 30-35 years old (6 %) as well as people under 20 years old (2 %). The sample profile is relevant for this paper because 86 % of respondents visited some city in Europe at least once, and only 14 % didn't.

1.2. Questionnaire development and survey design

In designing the survey, the Likert scale was used for the most relevant question about factors that influence travelers' behavior. The survey is designed so it can be used for both groups that are compared: International and Danish students. At the beginning of the survey, a few demographic questions were asked such as age, gender, current living place and home country. After that a question about frequency of visiting cities in Europe was asked. The most important question for this topic was the last question about factors. Here, students were asked what factors are important for them when choosing between cities in Europe for their next visit. The respondents were asked to answer the statements on a 5-point Likert scale ranging from "not important at all" (1) to "extremely important" (5).

The pilot project was done before the survey was distributed just to make sure that questions are understandable. The survey was sent to ten persons who are not working or studying in the tourism field and ten other persons who are familiar with the tourism field. The feedback from the pilot project was used to improve the questions in the survey and to make them clearer. Since one pilot respondent could not make a clear difference between the options "not important at all" and "not important", these were changed to "not important at all" and "not very important". There were also some options that were added after the pilot project to other questions. For example, the option "less than 20 years" was added to the age group question and "have not visited cities in Europe last year" was added to the question about frequency of visits.

The survey was conducted on-site: Danish students and international students living and studying in Esbjerg, were asked at the University of Southern Denmark to fill out the survey.

The on-site survey was done from the 24th of October until the 26th of October 2012. A total of 204 responses were gathered during this time and 192 of them were completely filled in. The data gathered from the 94 Danish students was compared with that of the 98 International students.

Results and Discussion

The components factor analysis created seven possible factors which were further analyzed by using the independent samples t-test and the one-way ANOVA test. These factors are:

- partying and having fun,
- accessibility to destination info,
- easy and cheap travel organization,
- outdoor activities,
- socializing with the local people,
- good shopping places,
- exploring the unknown.

The independent samples t-test was done in order to check if there are any statistically significant differences in factors that influence destination choice among Danish and international students. The one-way ANOVA test was used to define if there are statistically significant differences in motives of Danish and international students belonging to different age groups.

1.3. Differences in motivation between Danish and international students

The independent samples t-test (Tables 1 and 2) was used to identify whether there are differences between Danish students and international students who participated in the research in relation to the seven factors found through the factor analysis and to measure the actual level and significance of those differences. According to the t-test of independent samples, in case of **accessibility to destination info (f2), socializing with the local people (f5), good shopping places (f6) and exploring the unknown (f7)** there are significant differences between Danish and international students.

Table 1. The evaluation of seven factors influencing the choice of destination according to the home country of students

	What is your home country?	N	Mean	Std. Deviation	Std. Error Mean
partying and having fun	Denmark	94	2,8670	,60431	,06233
	other	98	2,9439	,65066	,06573
accessibility to destination info	Denmark	94	2,6170	,71439	,07368
	other	98	2,2347	,59075	,05968
easy and cheap travel organization	Denmark	94	3,2553	,59151	,06101
	other	98	3,2041	,53220	,05376
outdoor activities	Denmark	94	2,7234	,78157	,08061
	other	98	2,7551	,67444	,06813
socializing with the local people	Denmark	94	2,2837	,57830	,05965
	other	98	2,5170	,57061	,05764
good shopping places	Denmark	94	2,5745	,98907	,10202
	other	98	1,9796	,94137	,09509
exploring the unknown	Denmark	94	2,7128	,78113	,08057
	other	98	2,9898	,48151	,04864

Table 2. Independent samples t-test (n=192)

		t-test for Equality of Means								
		Levene's Test for Equality of Variances							95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
partying and having fun	Equal variances assumed	,034	,853	-,847	190	,398	-,07686	,09072	-,25581	,10210
	Equal variances not assumed			-,848	189,806	,397	-,07686	,09058	-,25553	,10182
accessibility to destination info	**Equal variances assumed**	**3,749**	**,054**	**4,048**	**190**	**,000**	**,38233**	**,09445**	**,19603**	**,56862**
	Equal variances not assumed			4,032	180,541	,000	,38233	,09482	,19523	,56942
Easy and cheap travel organization	Equal variances assumed	,001	,976	,631	190	,528	,05124	,08114	-,10881	,21128
	Equal variances not assumed			,630	185,986	,529	,05124	,08132	-,10918	,21166

outdoor activities	Equal variances assumed	4,928	,028	-,301	190	,764	-,03170	,10522	-,23925	,17586
	Equal variances not assumed			-,300	183,529	,764	-,03170	,10555	-,23994	,17654
Socializing with the local people	**Equal variances assumed**	**,013**	**,908**	**-2,814**	**190**	**,005**	**-,23332**	**,08292**	**-,39689**	**-,06975**
	Equal variances not assumed			-2,813	189,421	,005	-,23332	,08295	-,39694	-,06970
good shopping places	**Equal variances assumed**	**1,809**	**,180**	**4,270**	**190**	**,000**	**,59488**	**,13932**	**,32007**	**,86968**
	Equal variances not assumed			4,266	188,432	,000	,59488	,13946	,31977	,86998
exploring the unknown	Equal variances assumed	28,576	,000	-2,971	190	,003	-,27703	,09323	-,46093	-,09313
	Equal variances not assumed			**-2,944**	**153,586**	**,004**	**-,27703**	**,09411**	**-,46295**	**-,09111**

In case of the **accessibility to destination info (f2)** there is a difference between Danish students (M=2.6170, SD=0.71439) and international students (M=2.2347, SD=0.59075), t(190)=4.048, p<0.000 two-tailed. The difference between the mean values of the characteristics of the groups (mean difference =0.38233, 95% CI: 0.19603 to 0.56862) was moderate (eta squared = 0.079). Danish students have valued accessibility to destination info more than international students. A difference is also found in the case of **socializing with local people (f5)** between Danish students (M=2.2837, SD=0.57830) and international (M=2.5170, SD=0.57061), t(190)=-2.184, p<0.005 two tailed. The difference between the mean values of the characteristics of the groups (mean difference =-0.23332, 95 % CI: -0.39689 to -0.06975) was small (eta squared = 0.040). Danish students valued socializing with the local people less than others, and that means that other international students choose their tourist destinations more by a possibility of socializing with the locals than Danish students. **Good shopping places (f6)** are important for both group of students, and there is a significant difference between Danish students (M=2.5745, SD=0.98907) and others (M=1.9796, SD=0.94137), t(190)=4.270, p<0.000 two-tailed. The difference between the mean values of the characteristics of the groups (mean difference =0.59488, 95% CI: 0.32007 to 0.86968) was moderate (eta squared = 0.088). Danish students pay more attention to shopping when they choose a destination than other students from abroad. At the end of t-test analysis, authors found significant differences between Danish students (M=2.7128, SD=0.78113) and other students from abroad (M=2.9898, SD=0.48151), t(153.586)=-2.944, p<0.004 two tailed, in the case of **exploring the unknown (f7).** The difference between the mean values of the characteristics of the groups (mean difference =-0.27703, 95 % CI: -0.46295 to -0.09111) was small (eta squared = 0.044). This means that international students pay more attention to the possibility of exploring the unknown than Danish students when choosing a destination.

1.4. Differences in motivation between students according to their age group

The one-way ANOVA test (Tables 3,4 and 5) has shown that there are statistically significant differences between age groups only in the case of **outdoor activities** ($F(3, 188)= 5.232$, $p<0.002$). The application of Turkey's post hoc test showed that respondents who are 20 years old or less (M=4; SD=0.0) see outdoor activities as a more important determinant when choosing their destination than those who belong to the age groups between 20 and 24 years of age (M=2.6532; SD=0.75217), between 25 and 29 years of age (M=2.8269; SD=0.67071) and between 30 and 35 years (M=2.8333; SD=0.24618).

Table 3. The evaluation of seven factors influencing the choice of destination according to the age of students

Descriptives							
		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
						Lower Bound	Upper Bound
partying and having fun	Less than 20	4	3.1250	.43301	.21651	2.4360	3.8140
	Between 20 and 24	124	2.9315	.65047	.05841	2.8158	3.0471
	Between 25 and 29	52	2.8654	.61926	.08588	2.6930	3.0378
	Between 30 and 35	12	2.7500	.47673	.13762	2.4471	3.0529
	Total	192	2.9063	.62794	.04532	2.8169	2.9956
accessibility to destination info	Less than 20	4	2.6250	.72169	.36084	1.4766	3.7734
	Between 20 and 24	124	2.4395	.65283	.05863	2.3235	2.5556
	Between 25 and 29	52	2.3846	.67239	.09324	2.1974	2.5718
	Between 30 and 35	12	2.3333	.99620	.28758	1.7004	2.9663
	Total	192	2.4219	.68004	.04908	2.3251	2.5187
Easy and cheap travel organization	Less than 20	4	3.1667	.96225	.48113	1.6355	4.6978
	Between 20 and 24	124	3.2634	.54146	.04862	3.1672	3.3597
	Between 25 and 29	52	3.1795	.56961	.07899	3.0209	3.3381
	Between 30 and 35	12	3.1111	.62496	.18041	2.7140	3.5082
	Total	192	3.2292	.56113	.04050	3.1493	3.3090
outdoor activities	**Less than 20**	**4**	**4.0000**	.00000	.00000	**4.0000**	**4.0000**
	Between 20 and 24	**124**	**2.6532**	**.75217**	.06755	**2.5195**	**2.7869**
	Between 25 and 29	**52**	**2.8269**	**.67071**	**.09301**	**2.6402**	**3.0136**
	Between 30 and 35	**12**	**2.8333**	**.24618**	**.07107**	**2.6769**	**2.9898**
	Total	**192**	**2.7396**	**.72711**	**.05247**	**2.6361**	**2.8431**
Socializing with the local people	Less than 20	4	2.0000	.38490	.19245	1.3875	2.6125
	Between 20 and 24	124	2.4247	.64789	.05818	2.3096	2.5399
	Between 25 and 29	52	2.3718	.46980	.06515	2.2410	2.5026

	Between 30 and 35	12	2.4444	.32824	.09476	2.2359	2.6530
	Total	192	2.4028	.58469	.04220	2.3195	2.4860
good shopping places	Less than 20	4	2.0000	.00000	.00000	2.0000	2.0000
	Between 20 and 24	124	2.2742	.97396	.08746	2.1011	2.4473
	Between 25 and 29	52	2.4231	1.16056	.16094	2.1000	2.7462
	Between 30 and 35	12	1.6667	.49237	.14213	1.3538	1.9795
	Total	192	2.2708	1.00761	.07272	2.1274	2.4143
exploring the unknown	Less than 20	4	2.7500	.28868	.14434	2.2907	3.2093
	Between 20 and 24	124	2.9113	.70725	.06351	2.7856	3.0370
	Between 25 and 29	52	2.7692	.56414	.07823	2.6122	2.9263
	Between 30 and 35	12	2.6667	.57735	.16667	2.2998	3.0335
	Total	192	2.8542	.65888	.04755	2.7604	2.9480

Table 4. Anova test for the sample (n=192)

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
partying and having fun	Between Groups	.650	3	.217	.546	.652
	Within Groups	74.663	188	.397		
	Total	75.312	191			
accessibility to destination info	Between Groups	.370	3	.123	.264	.852
	Within Groups	87.958	188	.468		
	Total	88.328	191			
Easy and cheap travel organization	Between Groups	.457	3	.152	.480	.697
	Within Groups	59.682	188	.317		
	Total	60.139	191			
outdoor activities	**Between Groups**	**7.781**	**3**	**2.594**	**5.232**	**.002**
	Within Groups	**93.198**	**188**	**.496**		
	Total	**100.979**	**191**			
Socializing with the local people	Between Groups	.779	3	.260	.757	.520
	Within Groups	64.517	188	.343		
	Total	65.296	191			
good shopping places	Between Groups	5.880	3	1.960	1.960	.122
	Within Groups	188.036	188	1.000		
	Total	193.917	191			
exploring the unknown	Between Groups	1.245	3	.415	.955	.415
	Within Groups	81.672	188	.434		
	Total	82.917	191			

Table 5. Multiple comparison between age groups in relation to the value of the factors

Multiple Comparisons							
Tukey HSD							
Dependent Variable	(I) What is your age group?	(J) What is your age group?	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
outdoor activities	**Less than 20**	**Between 20 and 24**	**1.34677***	.35767	**.001**	.4196	2.2739
		Between 25 and 29	**1.17308***	.36533	**.008**	.2261	2.1201
		Between 30 and 35	**1.16667***	.40650	**.023**	.1129	2.2204
	Between 20 and 24	**Less than 20**	-1.34677*	.35767	.001	-2.2739	-.4196
		Between 25 and 29	-.17370	.11632	.444	-.4752	.1278
		Between 30 and 35	-.18011	.21286	.832	-.7319	.3717
	Between 25 and 29	**Less than 20**	-1.17308*	.36533	.008	-2.1201	-.2261
		Between 20 and 24	.17370	.11632	.444	-.1278	.4752
		Between 30 and 35	-.00641	.22549	1.000	-.5909	.5781
	Between 30 and 35	**Less than 20**	-1.16667*	.40650	.023	-2.2204	-.1129
		Between 20 and 24	.18011	.21286	.832	-.3717	.7319
		Between 25 and 29	.00641	.22549	1.000	-.5781	.5909
*. The mean difference is significant at the 0.05 level.							

1.5. Differences in motivation between students according to their gender

The independent samples t-test (Tables 6 and 7) was used to identify whether there are differences between the gender of respondents who participated in the research in relation to the 7 factors found through factor analysis and to measure the actual level and significance of those differences. According to the t-test for independent samples, in case of **good shopping places (f6)** there are significant differences between male and female respondents.

Table 6. The evaluation of seven factors influencing the choice of destination according to the gender of students

Group Statistics					
	What is your gender?	N	Mean	Std. Deviation	Std. Error Mean
partying and having fun	Male	64	2.9063	.71755	.08969
	Female	128	2.9063	.58103	.05136
accessibility to destination info	Male	64	2.3906	.60729	.07591
	Female	128	2.4375	.71541	.06323
Easy and cheap travel organization	Male	64	3.2917	.51606	.06451
	Female	128	3.1979	.58178	.05142
outdoor activities	Male	64	2.7344	.71252	.08907
	Female	128	2.7422	.73705	.06515

Socializing with the local people	Male	64	2.3646	.65793	.08224
	Female	128	2.4219	.54618	.04828
good shopping places	**Male**	**64**	**1.7813**	**.74469**	**.09309**
	Female	**128**	**2.5156**	**1.03471**	**.09146**
exploring the unknown	Male	64	2.7969	.56145	.07018
	Female	128	2.8828	.70287	.06213

Table 7. Independent samples t-test for the sample (n=192)

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95 % Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
partying and having fun	Equal variances assumed	4.094	.044	.000	190	1.000	.00000	.09639	-.19012	.19012
	Equal variances not assumed			.000	105.457	1.000	.00000	.10336	-.20493	.20493
accessibility to destination info	Equal variances assumed	.900	.344	-.449	190	.654	-.04688	.10433	-.25266	.15891
	Equal variances not assumed			-.474	145.913	.636	-.04688	.09880	-.24213	.14838
Easy and cheap travel organization	Equal variances assumed	2.700	.102	1.092	190	.276	.09375	.08586	-.07561	.26311
	Equal variances not assumed			1.136	140.388	.258	.09375	.08250	-.06934	.25684
outdoor activities	Equal variances assumed	214	644	-.070	190	.944	-.00781	.11161	-.22796	.21233
	Equal variances not assumed			-.071	129.988	.944	-.00781	.11035	-.22612	.21050
Socializing with the local people	Equal variances assumed	1.271	261	-.639	190	.524	-.05729	.08965	-.23413	.11955
	Equal variances not assumed			-.601	107.561	.549	-.05729	.09536	-.24633	.13174

good shopping places	Equal variances assumed	14.844	.000	-5.058	190	.000	-.73438	.14520	-1.02078	-.44797
	Equal variances not assumed			**-5.628**	**166.410**	**.000**	**-.73438**	**.13050**	**-.99202**	**-.47673**
exploring the unknown	Equal variances assumed	1.593	.208	-.851	190	.396	-.08594	.10094	-.28505	.11317
	Equal variances not assumed			-.917	153.625	.361	-.08594	.09373	-.27110	.09923

In the case of **good shopping places** there is a difference between male (M=1.7813, SD=0.74469) and female respondents (M=2.5156, SD=1.03471), t(166.410)=5.628, p<0.000 two-tailed. The difference between the mean values of the characteristics of the groups (mean difference =0.73438, 95 % CI: -0.99202 to -0.47673) was small (eta squared = 0.030). Female students have valued good shopping places more than male students when choosing a tourist destination.

Conclusion

One of the aims of this paper was to find out which factors influence young people when choosing a city destination. The results of the factor analysis led us to seven important factors in the decision-making process. These factors are: partying and having fun, accessibility to destination info, easy and cheap travel organization, outdoor activities, socializing with the local people, good shopping places and exploring the unknown.

Richards & Wilson (2003) also used factor analysis in their research on independent youth and student travel, and they identified four main motivating factors as experience seeking, relaxation seeking, sociability and contributing to the destination. It is not surprising that there are similarities between these two factor analyses, because both are dealing with motivation factors for young people. However, the tourist information sources and saving money factors, which are also important for students in Esbjerg do not fit into any of Richard's & Wilson's four factor groups. These differences might be caused by focusing only on city destinations in Europe and students living in Esbjerg in this research. The importance of tourist information sources (especially electronic sources) for destination choice is also confirmed in a study done by Jacobsen and Munar (2012). Their study provides empirical evidence of self-reported impacts of selected electronic and other information sources on international tourists' destination choices regarding a holiday location.

Our first hypothesis was that there are statistically significant differences in motives of Danish and international students when choosing a city destination in Europe. This hypothesis was confirmed by doing the t-test of independent samples. Based on the test results we can conclude that Danish students value the accessibility to destination info and the availability of good shopping places more than international students. However, international students seem to be more open and adventurous than Danish students since they pay more attention to connecting with the local people and exploring the unknown.

The second hypothesis was only partially confirmed since the only statistically significant differences in motives of students belonging to different age groups were found in the case of outdoor activities. Only students of 20 years old or less, pay more attention to outdoor activities when choosing a city destination.

The third hypothesis was also partially confirmed. The only statistically significant difference was in the case of good shopping places. This factor was more important for female respondents than male, which was to be expected since women usually have more developed shopping preferences than men.

Finally, we can conclude that there are significant differences between Danish and international students when it comes to choosing a city destination in Europe. However, if we neglect their origin, both male and female students are generally motivated by the same factors except in the

case of shopping places. A similar trend can also be seen in the case of different age groups where only the youngest consider the possibility for outdoor activities when choosing their city destination. Based on these results, we can also conclude that generally, young people of the same gender and age tend to be motivated by very similar factors when choosing a city destination in Europe.

The student target group is very important for tourism supply and for new city destinations in Europe. The estimation of the UNWTO for 2010 is that around 20% of the 940 million international tourists travelling the world were young people (UNWTO & WYSE Travel Confederation, 2011). Furthermore, international travel marketers need to understand travelers' unique needs or characteristics in order to develop successful marketing plans (Kim et al., 2006). Further research on cultural and national differences in relation to motivation can be very useful for new city destinations in organizing their marketing campaigns.

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Факторы, влияющие на мотивацию молодых людей при выборе города назначения в Европе – изучение проблемы на примере Эсбьерг (Дания)

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Аннотация. В работе рассматриваются мотивационные факторы, которые влияют молодых людей при выборе районов города в Европе и имеет целью показать, есть ли какие-либо различия в процессе принятия решений между датскими и иностранных студентов. Предыдущие исследования научил нас, что решение купить туристический продукт представляет собой сложный процесс. Таким образом, любой вид различий может быть существенным в разработке соответствующих маркетинговых стратегий для различных сегментов рынка. Результаты этого исследования показывают, что существует семь основных фактора для молодых людей при выборе города назначения в Европе. Дальнейший анализ показывает, что существуют значительные различия между несколькими факторами мотивации, когда дело доходит до датских и иностранных студентов. Вклад этого исследования является его признаком, к которому факторы влияют город выбор назначения среди молодежи, который будет способствовать дальнейшему позволяют европейских городов, чтобы развивать и продвигать более целесообразных и удовлетворительные туристических продуктов и услуг для своих маленьких посетителей.

Ключевые слова: выбор назначения; молодые люди; мотивация; районов города; Дания.