Cognitive Factors of Life Satisfaction among the Russian Elderly

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Abstract. The overall aim of this article was to examine factors related to life satisfaction in old age. There are several approaches to understanding life satisfaction in psychology. Some theories that emphasize objective circumstances as most influential for life satisfaction are commonly labelled bottom-up theories, whereas theories that focus on stable individual characteristics are commonly labelled top-down theories. It is argued that certain personality traits, in particular extraversion and neuroticism, partly determine a person’s satisfaction with life. At the same time, cognitive factors related to life satisfaction are rarely the subject of empirical research. In this study, age, social status (works, does not work, in retirement), type of family (nuclear or extended), and a number of indices of cognitive functioning (cognitive flexibility, memory – short-term and long-term, creativity and thinking) were used as predictor variables of life satisfaction. Ninety-seven respondents aged 50–84 participated in the research, which finds that, along with non-cognitive factors of life satisfaction, cognitive factors play great roles as well. Based on the data obtained, an empirical model of cognitive factors of life satisfaction was constructed. This research demonstrates that all cognitive variables examined (flexibility of thinking, long-term memory, short-term memory, thinking and creativity) make positive contributions to increasing satisfaction; notably the roles of long-term memory and creativity are especially salient. This study also found satisfaction is significantly higher among working older respondents when compared with their non-working colleagues, with the oldest employees the most satisfied. Family status is a factor related to life satisfaction in old age as well, since old people who live with a spouse are more satisfied than those who live in extended families with children and grandchildren. A regression model combined variables from top-down and bottom-up theories. The model includes memory and age as personal characteristics, and family type as a circumstantial predictor for life satisfaction in old age.

Key words: life satisfaction, old age, cognitive processes, top-down theories, bottom-up theories, predictors for life satisfaction, the Russian elderly

Introduction

Life satisfaction and the prospect to age well are important for everyone. In recent decades numerous empirical researches have been directed at clarifying the level of its stability across lifespan and at identifying of relevant its predictors as well.
The stability of life satisfaction. The earliest works on stability of life satisfaction find that old age is not necessarily associated with a decrease in the latter (Lawton, 1975; Neugarten et al., 1961). More recent work has shown that there are even some benefits that appear with age (Charles et al., 2001; Diener, Suh, 1997; Mroczek, Kolarz, 1998; An, Cooney, 2006; Freund, Baltes, 2002; Holahan et al., 2008).

The most extensive information was obtained in Gallup World Poll Life Satisfaction study. This study was conducted in 160 countries and covered 98% of the world's population. Results found that in rich English-speaking countries, the relationship between life satisfaction and age is U-shaped with a minimum at 45–54 years of age. However, this result is not universal. For example, no U-shaped pattern was found in the study conducted in England, Germany, and Australia (Stone et al., 2010). In Eastern Europe and Latin America, life satisfaction decreases with age, while in sub-Saharan Africa life satisfaction does not change with age (Stephoe et al., 2015).

The main theory that explains how life satisfaction can increase despite declining health and income is the theory of social and emotional selectivity (Carstensen et al., 2003). It is assumed that while aging, a person accumulates emotional wisdom which leads to the choice of more emotionally safe events, the establishment of emotionally neutral friendships. Thus, despite the death of loved ones, loss of social status associated with retirement, deterioration of health and reduced income, the level of life satisfaction remains and even increases among older people.

The decline in life satisfaction in middle age is explained by economic theory. Middle age is the period in a person's life when income, as a rule, reaches the maximum level. This is the best time to work and earn money even at the expense of own psychological well-being during this period. All this is done in order to have a higher level of well-being and well-being in later life (Steptoe et al., 2015).

Although the results of life satisfaction stability studies are sometimes ambivalent, in general they suggest that the older generation, even less healthy and, in general, less productive, may be more satisfied with their lives compared to middle-aged one.

Predictors of life satisfaction. The question why some people are more satisfied with their lives than others is connected with the other research branch – with the one which aims to study predictors of life satisfaction. There are two main types of theories about life satisfaction: top-down and bottom up.

Bottom-up theories state that life satisfaction is a result of satisfaction in the many domains of life. The underlying idea is that life satisfaction is equal to the sum of pleasant and unpleasant experiences and life circumstances’ conditions (Campbell et al., 1976). Most studies use this approach.

Numerous studies have shown that cultural context can be a factor of life satisfaction (Diener, Suh, 2000; Kitayama, Markus, 2000; Uchida et al., 2004). For Hofstede (1980), in individualist cultures, one is regarded as separated from others, with personal goals taking priority over group goals. In collectivistic cultures, one is seen as connected to others, he/she is an integral part of a society in which group norms take priority over personal needs (Markus, Kitayama, 1991). Accordingly, life satisfaction in independent cultures is associated with high level of autonomy (Oishi, 2000) and personal achievements (Uchida, Kitayama, 2009),
with self-esteem (Diener E., Diener M., 1995; Diene, Suh, 2000), self-confidence and motivation (Kitayama, Markus, 2000). Social harmony (Kang et al., 2003; Uchida, Kitayama, 2009), close family ties (Oishi, Diener, 2001), and emotional support from significant others (Uchida et al., 2008) are the key to life satisfaction in collectivist cultures.

A number of other factors of life satisfaction in old age have been revealed. In Berg’s study social network quality, self-rated overall health, sense of being in control of one’s life, and depressive symptoms were significantly associated with life satisfaction in individuals 80+ (Berg et al., 2009).

The importance of satisfaction from relationships with the closest family (a spouse, children, grandchildren) has been shown as a predictor of life satisfaction for elderly in Poland (Kozerska, 2015). Health self-assessment as an important factor of life satisfaction has been revealed for elderly population in Sweden, Austria and Germany (Kutubaeva, 2019).

The primacy of health as the determinant of life satisfaction among the oldest-old in China has been shown in the Chinese Longitudinal Healthy Longevity Survey (n = 6530) (Ng et al., 2017).

The significance of health as a predictor of life satisfaction has been shown for Indian sample as well (Choudhary, 2013). The findings reveal that there is consistent relationship between life satisfaction and health. Health was revealed as a factor of life satisfaction in South Korea, but economic condition was the most influential factor (Jung, Mankyu, 2010). Summarizing the results of determinants of life satisfaction in old age, it can be stated that the list of variables under study is rather long (education, place of residence: city vs. town, regular physical activity, access to social security provisions, etc.) but good health, lack of money problems and social support are the strongest correlates of life satisfaction.

On the other hand, top-down theories state that person’s overall life satisfaction influences his/her overall life satisfaction in the many different domains (Eid, Diener, 2004; Heller et al., 2004). Such personal traits as extraversion and neuroticism determine the level of life satisfaction (Costa, McCrae, 1980). Psychological capital (optimism, resilience and self-efficacy) and positive attitude towards aging have been found to be positively associated with psychological capital (Pramanik, Biswal, 2020).

Preserved cognitive functioning is commonly considered an important part of life satisfaction in old age (Jones et al., 2003). At the same time it should be noted, however, that life satisfaction as a function of cognitive aging is rarely the subject of research in this subject area (Belovol et al., 2015).

Aging is an irreversible biological process that results in an inevitable decrease in effectiveness of cognitive functions. We often hear that older people complain about memory, attention, and draw attention to the fact that they are increasingly struggling to learn new skills. This fact, as a rule, is experienced by a person quite hard and results in a number of negative emotions. Awareness of the deficit of one's own cognitive functioning cannot but influence the degree of life satisfaction.

The objectives of the study were to find cognitive predictors of life satisfaction and to study the effect of different types of variables on life satisfaction among the Russian elderly.
Method

Sample. In total, the study involved 97 participants aged between 50 and 84 years. At the time of the study, 58% of them were employed and 42% were retired. Each age group included both employed and retired respondents.

Procedure. The participants were recruited on a voluntary basis, using snowball sampling methods. All the researchers were qualified psychologists (with at least a BA degree in psychology); they were instructed to invite people of different ages and social backgrounds to participate. To collect data, they visited the participants at their homes. The sessions lasted 1.5–2 hours including testing and breaks. Cognitive tests required concentration and vigilance, so they were administered within the first hour. It usually took 3–4 sessions to collect all the data. The participants were asked to complete the Life Satisfaction inventory as well. All the participants ($N = 97$) freely agreed to answer the questionnaires and tests, and gave informed consent.

Measures:

Life satisfaction. The Life Satisfaction Index (Neugarten et al., 1961) was used in a Russian-language adaptation (Panina, 1993). The original 20-item Life Satisfaction Index-A consists of statements related to life satisfaction in old age such as: “As I grow older, things seem better than I thought they would be” or “When I think back over my life, I didn’t get most of the important things I wanted”. A three-point Likert scale was used. The participants rated each statement from “agree” to “do not agree”. The sum of the scale ranged from 0 to 40, with higher scores indicating greater life satisfaction.

Predictor variables. To explain the features of life satisfaction, the following variables were used: age, social status (employed, unemployed, retired), family type (nuclear or extended), and a number of indices of cognitive functioning: cognitive flexibility, memory (short-term and long-term), creativity and thinking.

Age was presented in years (average = 64.1, standard deviation = 8.5). Social status reflected the fact whether a person was employed or retired. Family type concerned the characteristics of personal life: whether a respondent lived with a spouse in a nuclear family, or the parents lived together with their children, or sometimes even with their grandchildren. Some of the participants lived alone.

Cognitive flexibility, i.e. the ability to switch from one cognitive strategy to another, was studied using The Stroop Color and Word Test. The test can be used for individuals in a wide age range (from 15 to 90), it is easy to perform and is one of the standard tools for neuropsychological diagnostics: it is used to assess brain dysfunction, features of cognitive functioning and various types of psychopathologies.

Short-term memory was studied using a test developed by Japanese researchers to study the memory of elderly people; it consists of two almost identical pictures, which, however, differ in 10 features: the task is to identify these differences (Nishiguchi et al., 2014).

Long-term memory was assessed using The Mini-Cog technique. The technique includes a task for memorizing and reproducing three words with a masking stimulus between the presentation of words and their reproduction.

The Understanding of Metaphorical Meaning Test by B.V. Zeigarnik was used to study thinking. The method is aimed at identifying the respondent’s ability
to highlight the main idea in a phrase of a specific content, as well as to identify the differentiation and purposefulness of judgments.

**Creativity** was studied by means of the “circles” subtest from *The Torrance Tests of Creative Thinking*.

**Results**

The above techniques allowed us to study the features of cognitive functioning and levels of life satisfaction in elderly. Figure 1 shows the density trace curve for life satisfaction indices.

![Density trace](image)

**Figure 1.** Density trace

![Means and 95.0% LSD Intervals](image)

**Figure 2.** Comparative analysis of life satisfaction indices for elderly people with different social status

The median for satisfaction score is 27 points, which is higher than the average. In this case, it follows from Figure 1 that the distribution is biased towards higher indicators of life satisfaction. Thus, it should be noted that elderly people are satisfied with their lives.
As for the effect of age on life satisfaction, the correlation analysis did not reveal a significant relationship between age and satisfaction. This result is especially interesting, since there is a persistent stereotype in society that this indicator decreases with age. It turns out that regardless of age, people can be either satisfied with life or not.

To study features of life satisfaction of employed versus unemployed/retired persons, a comparative analysis was carried out using the Mann – Whitney test. The revealed differences are statistically significant ($W = 118.5$, $p$-value ≤ 0.05). The results of the comparative analysis are graphically shown in Figure 2.

*Family type* is another significant factor of life satisfaction. People who live in nuclear families are more satisfied compared to their peers who live in extended families with their grown-up children or live alone. The results are graphically presented in Figure 3.

![Means and 95.0% LSD Intervals](image)

**Figure 3.** Comparative analysis of life satisfaction indices for elderly people from different type families

The higher level of life satisfaction among the elderly people who live with their spouses is confirmed by multiple range tests (Table 1).

<table>
<thead>
<tr>
<th>Contrast</th>
<th>Sig.</th>
<th>Difference</th>
<th>+/- Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alone – extended</td>
<td>1.68944</td>
<td>5.40414</td>
<td></td>
</tr>
<tr>
<td>Alone – nuclear</td>
<td>-3.69643</td>
<td>6.47934</td>
<td></td>
</tr>
<tr>
<td>Extended – nuclear</td>
<td>*</td>
<td>-5.38587</td>
<td>5.13867</td>
</tr>
</tbody>
</table>

*Note:* * – denotes a statistically significant difference.

The difference between those who live alone and elderly people who live in extended families is statistically insignificant.

An analysis of variance was carried out to determine the effect of age factors and continuing labor activity on life satisfaction. The main effect was found
for the “employed – unemployed/retired” factor. At the same time, the second-order interaction between age and work factors was revealed.

The results of interaction are graphically shown in Figure 4.

Figure 4. Interaction plot for age and social status (employed – unemployed/retired) variables

It follows from Figure 4 that the dynamics of life satisfaction in the two groups is different. The elderly people who still work are significantly more satisfied with life compared to their unemployed/retired peers. At the same time, in this age group, the representatives of the older age group are the most satisfied (the curve on the graph increases for employed elderly respondents, whereas we can observe a sharp decline in satisfaction with age for their peers from the group of unemployed/retirees). It can be concluded that elderly employed people are completely satisfied with their lives. Their level of satisfaction is significantly higher than that of their unemployed/retired peers, and the most satisfied are the most senior employees. Thus, one of the ways to improve the psychological well-being of people in the ‘third age’ is to organize and ensure their feasible labor activity.

Multiple regression analysis was used to clarify the cognitive determinants of life satisfaction (standardized beta coefficients are used in the model). Its results are presented below:

\[
\text{Life satisfaction} = 0.0956785 \times \text{cognitive flexibility} + 3.83159 \times \text{long-term memory} + 0.63755 \times \text{short-term memory} + 0.675925 \times \text{thinking} + 1.40116 \times \text{creativity}.
\]

The resulting model can be considered quite satisfactory. The degree of its adequacy to empirical data is determined by the coefficient of determination. In this case, the coefficient of determination of the model (R-square) is almost equal to 90% (89.7462%). The high quality of the model is confirmed by the results of the analysis of variance (Table 2).

The data in Table 2 strongly suggest a statistically significant relationship between the variables in the model. Table 3 shows the standardized coefficients of the model.
Table 2

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F-ratio</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>26513.7</td>
<td>5</td>
<td>5302.75</td>
<td>61.27</td>
<td>0.0000</td>
</tr>
<tr>
<td>Residual</td>
<td>3029.27</td>
<td>35</td>
<td>86.5507</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total (Corr.)</td>
<td>29543.0</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Estimate</th>
<th>T-statistic</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive flexibility</td>
<td>0.0956785</td>
<td>2.20141</td>
<td>0.0344*</td>
</tr>
<tr>
<td>Long-term memory</td>
<td>3.83159</td>
<td>1.97968</td>
<td>0.0456*</td>
</tr>
<tr>
<td>Short-term memory</td>
<td>0.63755</td>
<td>0.428584</td>
<td>0.2709</td>
</tr>
<tr>
<td>Thinking</td>
<td>0.675925</td>
<td>1.197100</td>
<td>0.0393*</td>
</tr>
<tr>
<td>Creativity</td>
<td>1.40116</td>
<td>3.37203</td>
<td>0.0018**</td>
</tr>
</tbody>
</table>

Note. * – p ≤ .05; ** – p ≤ .01.

Table 3 shows that all the variables except the short-term memory variable are significant and cannot be excluded from the model. However, in this case, we considered it appropriate to leave all the variables in the model. The standardized coefficients of the model reflect the comparative significance of the contribution made by the variables to life satisfaction. Since all the variables included in the model have a plus sign, their contribution to the life satisfaction variable is positive. At the same time, the greatest contribution is made by such variables as long-term memory (with a rate of 3.83159) and creativity (with a rate of 1.40116).

To clarify the impact of the top-down and bottom-up variables, a complex regression model was created that included all the variables. The fitted model equation is:

\[
\text{Life satisfaction} = 0.110918 \times \text{thinking} + 0.533186 \times \text{creativity} + 0.0486768 \times \text{long-term} + 3.70894 \times \text{short-term memory} + 0.00296713 \times \text{cognitive flexibility} - 3.44459 \times \text{labour} + 4.04821 \times \text{marital} + 0.219421 \times \text{age}.
\]

The R-squared statistic indicates that the model as fitted explains 93.9269% of the variability in Life satisfaction.

Since the p-value in the ANOVA table (Table 4) is less than 0.05, there is a statistically significant relationship between the variables at the 95.0% confidence level.
To simplify the model and exclude variables with the smallest coefficients and the highest p-values of the independent variables, the Stepwise regression was used. The regression model equation is:

\[ \text{Life satisfaction} = 3.90722 \times \text{short-term memory} + 4.2683 \times \text{marital} + 0.212633 \times \text{age}. \]

All the variables in the resulting regression model are statistically significant since their p-value is less than 0.05, and they are statistically significant at the 95.0% confidence level.

**Conclusion**

This study has shown that, along with non-cognitive factors of life satisfaction in elderly people, there are also cognitive factors that are rarely the subject of empirical research. Based on the data obtained in the study, an empirical model of cognitive factors of life satisfaction was built. It was shown that nearly all the cognitive variables (flexibility of thinking, long-term memory, thinking and creativity) made a positive impact to increasing satisfaction with the leading role of long-term memory and creativity.

In general, the study showed that the degree of satisfaction is significantly higher among employed elderly respondents compared to their unemployed/retired peers, whereas the most satisfied are the oldest employees (the group with an average age of 76 years).

Family status is a factor of life satisfaction in old age as well. An unusual finding of our study is that members of nuclear families are the most satisfied group in the research. It is considered that tradition to live in extended families in Russia has a positive effect and a number of researches confirm this idea (Mustaeva et al., 2016, for example).

Thus, on the one hand, the organization of feasible labor activity for persons in the “third age” can be considered as one of the ways to increase their life satisfaction. On the other hand, ensuring the preservation of cognitive functions is also an essential condition for increasing life satisfaction in old age. Previous research by the authors has shown that teaching new skills and knowledge to third-age people may be one such option (Belovol et al., 2015).

Variables corresponding top-down and bottom-up theories have been included in the study. Top-down theory argues that personality features predispose to levels of life satisfaction. In our research these features include age and characteristics of cognitive functioning (memory, thinking, creativity, and cognitive flexibility). According to bottom-up theories life satisfaction depends on the fulfillment of certain human needs and is equal to the sum of conditions associated with different areas of life. These approaches are evidently controversial. Our study incorporates both. The resulting regression model combined variables from top-down and bottom-up theories. According to the results obtained, elderly persons who live with their spouses are more satisfied than those who live in extended families with their children and grandchildren. Independence, autonomy and self-efficiency make these people more satisfied with their lives rather than the need to live in a large family, to adapt to its needs and obligations. This result is not typical for Russia where extended families have always been considered traditional. Most likely, the re-
sult reflects changes in social and economic structure of society. But to clarify the results, it is necessary to conduct additional research in different regions of the country.

Cognitive function is also a factor of life satisfaction in elderly people. Memory and creativity play an important role in making people feel good in old age. People should strive to prevent cognitive decline with age, and lifelong learning is one of the most effective cognitive activities.

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References


Когнитивные факторы удовлетворенности жизнью в пожилом возрасте

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Аннотация. В работе изучаются факторы удовлетворенности жизнью в пожилом возрасте. В настоящее время в психологии существует несколько подходов к пониманию этого конструктора. Ряд теорий акцентирует внимание на объективных обстоятель-
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В статьях как оказывающих основное влияние на удовлетворенность жизнью личности. Такой подход называется «восходящий» (bottom-up). При этом существуют теории, в которых предполагается, что стабильные индивидуальные характеристики личности являются детерминантами удовлетворенности жизнью. Данные теории объединяются в рамках подхода, который получил название «нисходящий» (top-down). Он подразумевает, что определенные черты личности, в частности экстраверсия и тревожность, определяют удовлетворенность человека жизнью. Однако когнитивные факторы удовлетворенности жизнью редко становятся предметом эмпирических исследований. В настоящем исследовании в качестве предикторов удовлетворенности жизнью на поздних этапах онтогенеза наряду с показателями когнитивного функционирования личности (когнитивная гибкость, память – краткосрочная и долгосрочная, креативность) использовались такие объективные показатели, как возраст, социальный статус (работает, не работает, на пенсии), тип семьи (нуклеарная или расширенная). В исследовании приняли участие девяносто семь респондентов в возрасте от 50 до 84 лет. Анализ полученных данных показал, что не только некогнитивные факторы, но и когнитивные оказывают существенное влияние на удовлетворенность жизнью в пожилом возрасте. На основе полученных данных была построена эмпирическая модель когнитивных факторов удовлетворенности жизнью. Показано, что все когнитивные переменные (гибкость мышления, долговременная память, кратковременная память, мышление и креативность) имеют положительный вклад в повышение удовлетворенности при ведущей роли долговременной памяти и креативности. Исследование выявило, что степень удовлетворенности жизни значительно выше у работающих пожилых респондентов, чем у их неработающих коллег, при этом наиболее удовлетворенными являются самые пожилые сотрудники (средний возраст этой группы – 76 лет). Семейное положение также является фактором удовлетворенности жизнью в пожилом возрасте. Согласно полученным результатам, пожилые люди, живущие с супругом/супругой и отдельно от детей, более удовлетворены жизнью по сравнению со своими сверстниками, живущими в расширенных семьях с детьми и внуками. Регрессионная модель, построенная с учетом как характеристик личности, так и переменных, отражающих объективные аспекты жизни пожилых людей, объединила переменные из восходящих и нисходящих теорий. В результатирующую модель (коэффициент детерминации $R^2 = 94,6\%$) были включены переменные с коэффициентами на уровне значимости $\alpha < 0,05$. Остальные переменные были исключены из результатирующей модели. В нее вошли память и возраст как индивидуальные особенности и тип семьи как внешний предиктор удовлетворенности жизнью в пожилом возрасте.

Ключевые слова: удовлетворенность жизнью, старость, когнитивные процессы, нисходящие теории, восходящие теории, предикторы удовлетворенности жизнью

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