

Scale "Subjective age" adaptation on the sample of russian retirees: contribution to the sustainable development of society

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Abstract. The article presents the results of adaptation of the Scale of Subjective Age on a sample of the retirees living in the industrial city of Russia. The procedure of statistical verification of the «Age-of-me» method is detailed. The results of the exploratory and confirmatory factor analysis (N=291), as well as the results of the correlation analysis, confirmed the factor and convergence validity of the scale on the sample of retirees. The scale shows an acceptable level of reliability of the scale in terms of internal consistency. The prospects of applying the technique in socio-psychological research are discussed.

1 Introduction

Analysis of modern works of the international researchers shows that the study of subjective age is especially relevant for samples of old, late, retirement age [1, 2, 3, 4, 5]. Many scientists study subjective age in older persons in relation to successful ageing, subjective well-being and life satisfaction. As the results show [4, 6, 7, 3, 8], the subjective age of elder people is closely related to their physical and psychological health.

An overwhelming number of researchers conclude that feeling younger than real age (younger subjective age) has a positive effect on the satisfaction with life in old age (e.g. [1]). However, some studies (e.g. [8]) have found that the desire to be younger is related to dissatisfaction with life and poor physical health.

A definite way out of this contradiction is found in the study of Blöchl with colleagues [1]. Researchers have established that there is a limit between feeling younger than chronological age and feeling satisfied with life. People within this period have the highest life satisfaction rates. However, going beyond it causes psychological harm and significantly reduces life satisfaction (ibid.).

The second contradiction concerns the consideration of the stability and plasticity of subjective age. A study of the subjective age of the elderly during the COVID 19 pandemic showed that it had not undergone significant changes [9]. This fact suggests the persistence of subjective age to difficult life situations. At the same time, another study shows that how

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older people feel their psychological age can vary on a momentary basis depending on their emotional state [2].

These inconsistencies can be attributed to various psychodiagnostic tools used to explore subjective age. For the study of subjective age of Russian respondents, Kastenbaum et al. 1972 [10] method is usually used, which involves the identification of four aspects of subjective age (emotional, biological, social, intellectual), but in different variations. Thus, in a number of studies, all four components of subjective age are averaged to form one common indicator (e.g. [11]). The same tool in the adaptation of Sergienko [4, 12] offers to calculate all four indicators separately, but the procedure of statistical testing of the methodology and its suitability for this age category in the literature is not found.

On this basis, the purpose of this study was formulated which is the statistical testing of the «Age-of-me» scale and to study the possibility of its application to the sample of Russian-speaking respondents of retirement age.

2 Methods and Sample

The study involved Russian-speaking respondents living in Chelyabinsk (Russia). A total of 291 persons were interviewed (34 per cent men, average age 65.5 years, 16 per cent have a disability, 53 per cent are married, 47 per cent have higher education, 16 per cent live in a nursing home). The questionnaires were offered by the respondents in paper form, completed individually under the supervision of the researcher.

The “Age-of-Me” technique in author’s adaptation was used to diagnose subjective age [13]. The questionnaire consists of four statements with missing values, in which a digit must be entered: 1. I feel, as it seems to me, for ___ years; 2. I think I look ___ years old; 3. In my opinion, I act like a person of ___ years; 4. My interests mainly correspond to the interests of a person ___ years old. The first statement characterizes the cognitive-emotional (feel-age) age, the one at which a person "feels oneself". The second statement reflects the biological (physical) age (look-age) – "the age that a person looks like." The third statement conveys the social age (do-age) – "the age at which a person acts." The fourth statement describes the intellectual age of a person (interest-age) – this is "the age at which a person shows his or her interests".

The results were counted in two ways. First, the figures (age) given by the respondents in the survey (on four scales) were the primary data. Second, the difference between the age indicated in the statements by the respondents and the chronological age was calculated. In the second case, the higher the indicator, the younger the subjective age is diagnosed.

Temporal Focus Scale [14], Basic Beliefs Scale [15], Life Satisfaction Scale [16] were used to test the convergent validity of the scale.

Statistical processing methods: exploratory factor analysis (maximum likelihood method); correlation analysis; confirmatory factor analysis; α -Kronbach coefficient, descriptive statistics. The obtained data was processed using the SPSS Statistic. Rus. V.24.0 software package (IBM Corporation, Armonk, NY, USA).

3 Results

In the first stage, the validity of the questionnaire was checked. To justify the factor validity, an exploratory factor analysis (maximum likelihood method) was used, the results of which are presented in the Table 1.

Table 1. Factor structure of the questionnaire: primary data.

Variables	Estimates
Cognitive-emotional age	.781
Physical age	.778
Social age	.933
Intellectual age	.912
Share of explainable variance, %	72.95

Exploratory factor analysis (KMO=0.782, p=0.0001) of the variance of the questionnaire’s statements allowed to allocate one factor explaining 72.95% of the total variance. This factor reflects the notion of subjective age of respondents and shows that its different types (cognitive-emotional, physical, social and intellectual) fit together well. At the same time, social and intellectual age are more important in the overall structure of subjective age. This is probably due to the biological age of the respondents, when experience and wisdom are more important than appearance.

An exploratory factor analysis of the deviation of subjective age from real age was then performed (table 2).

Table 2. Factor structure of the questionnaire: the deviation of subjective age from real.

Variables	Estimates
Cognitive-emotional age (delta)	.681
Physical age (delta)	.642
Social age (delta)	.899
Intellectual age (delta)	.853
Share of explainable variance, %	60.27

In general, the results of the analysis of derived data show comparable results, albeit with slightly lower coefficients. The variances of all subscales formed a single factor explaining 60.27% of the total variance. This factor can be interpreted as the degree of deviation of subjective age from real (biological) one.

Indicators of the types of subjective age are well correlated, both in direct terms of subjective age (table 3) and in deviation of subjective age from real one (table 4). This fact also supports the subjective age measure as a one holistic phenomenon.

Table 3. Age-of-me intercorrelation (primary data).

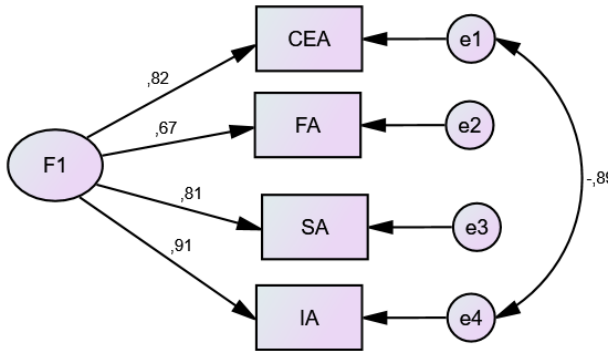
Variables	Cognitive-emotional age	Cognitive-emotional age	Cognitive-emotional age	Cognitive-emotional age
Cognitive-emotional age	1,000			
Physical age	,800**	1,000		
Social age	,723**	,728**	1,000	
Intellectual age	,694**	,698**	,862**	1,000

Table 4. Age-of-Me intercorrelations (Subjective Age Deviation from Real Age).

Variables	Cognitive-emotional age (delta)	Cognitive-emotional age (delta)	Cognitive-emotional age (delta)	Cognitive-emotional age (delta)
Cognitive-emotional age (delta)	1,000			
Physical age (delta)	,704**	1,000		

Social age (delta)	,592**	,580**	1,000	
Intellectual age (delta)	,549**	,533**	,793**	1,000

Further, confirmatory factor analysis was carried out to test and correct the factor validity of the scale. The results are presented in Fig. 1 and Table 5.



CMIN=62,799; df=1; p=,000; CFI=,900; RMSEA=,462; GFI=,911; Plcose=,000

Fig. 1. Results of confirmatory factor analysis of scales Age-of-Me (deviation of subjective age from realone).

Notes: CEA - cognitive-emotional age (delta), FA - Physical age (delta), SA - Social age (delta), IA - Intellectual age (delta).

Table 5. Age-of-Me regression coefficients (deviation subjective age from real one).

			Estimate	S.E.	C.R.	P
CEA	<---	F1	1,000			
FA	<---	F1	,615	,058	10,596	***
SA	<---	F1	,747	,060	12,433	***
IA	<---	F1	,766	,059	12,902	***

Notes: CEA - cognitive-emotional age (delta), FA - Physical age (delta), SA - Social age (delta), IA - Intellectual age (delta)

Confirmatory analysis found a subjective age model (one factor) well-matched to the original consent index data as for the primary data (CMIN = 59.101; df = 1; p = 0.000; GFI = 0.916; CFI = 0.938; RMSEA = 0.448), so with the subjective age deviation from the real one (CMIN = 62.799; df = 1; p = 0.000; GFI = 0.911; CFI = 0.900; RMSEA = 0.462). Estimated model parameters were statistically reliable: regression coefficients (p<0.001) and covariances (correlations) between errors (p<0.01).

Next, the reliability of the scale was tested on the basis of the internal consistency of its statements with the application of the coefficient α Kronbach: "Subjective age" ($\alpha=0.913$), "Deviation of subjective age from real age" ($\alpha=0.852$). It can be argued that the adapted scale shows a high level of reliability.

Further, in order to test the convergent validity of the scale, a correlation analysis was carried out with Scale of Basic Beliefs [15], Life Satisfaction Scale [16], and Temporal Focus Scale [14].

Table 6. Results of the correlation analysis of the Age-of-Me Scale and the Basic Belief Scale.

Variables	Goodwill	Justice	Self	Luck	Control
Cognitive-emotional age	-,214**	-,138*	-,241**	-,267**	-,239**
Physical age	-,122*	-0,081	-,171**	-,181**	-,190**
Social age	-,135*	-0,040	-,185**	-,122*	-,174**
Intellectual age	-0,110	-0,047	-,155**	-,152**	-,167**
Cognitive-emotional age (delta)	,215**	,232**	,239**	,287**	,303**
Physical age (delta)	0,085	,174**	,156**	,186**	,253**
Social age (delta)	,120*	0,103	,158**	0,100	,207**
Intellectual age (delta)	0,105	0,108	,134*	,148*	,214**

The correlation analysis (table 6) shows the relationship between all types of subjective age and positive basic beliefs. The more older people are convinced that the world around them is well-meaning and manageable, the more their beliefs about their own value and luck are formed, the younger they perceive themselves in terms of feelings, emotions, actions, and interests. The relationship between younger subjective age and belief in the justice of the world, in what everyone ultimately gets, is somewhat weakened. It was difficult to determine exactly the reason of this, so further research is needed.

There is a moderate correlation between cognitive-emotional ($r=-,203$ at $p=0,000$) and physical ($r=-,141$ at $p=0,016$) types of subjective age and life satisfaction. The same applies to the indicators of deviation of subjective age from the real one, but with the opposite sign: cognitive-emotional age ($r=,258$ at $p=0,000$) and physical age ($r=,199$ at $p=0,001$). At the same time, there is a pronounced tendency towards a significant correlation of the indicators of life satisfaction and deviation of social age from the real one ($r= 0.106$ at $p=0.07$), and deviation of intellectual age from real one ($r= 0.091$ at $p=0.12$). The results are consistent with earlier evidence that younger age is associated with greater life satisfaction (e.g., [1]).

A correlation analysis of subjective age and temporal focus scales shows moderate explanatory relationships (table 7).

Table 7. Results of the correlation analysis of the Age-of-Me and Temporal Focus Scales.

Variables	Past Focus	Current Focus	Future Focus
Cognitive-emotional age	0,024	-,120*	-0,053
Physical age	0,065	-0,073	-0,062
Social age	0,055	-,121*	-0,047
Intellectual age	0,088	-,143*	-0,099

Cognitive-emotional age (delta)	0,017	,144*	0,068
Physical age (delta)	-0,036	0,087	0,091
Social age (delta)	-0,050	,128*	0,054
Intellectual age (delta)	-0,087	,160**	0,106

Most obviously all types of subjective age are connected by a current focus. Older people who are more present-living, involved in current events view their cognitive-emotional, physical, social, and intellectual age as younger. Given that the current focus is linked to a high level of life satisfaction [14], the relationship of younger subjective age and current focus correlates well with previous results.

In addition, correlations between subjective intellectual age and the past focus and future focus, but with the opposite sign, were found at the level of the tendency. Whereas younger intellectual age (the interests of younger people) is associated with a future focus, the past focus is related to older intellectual age. Thus, the correlation analysis confirms the convergent validity of the adapted methodology.

In conclusion, descriptive statistics were calculated separately from samples of men and women. The data are shown in Table 8.

Table 8. Descriptive statistics.

Variables	Men				Women			
	min	max	M	σ	min	max	M	σ
Cognitive-emotional age	4	90	54,3	16,56	15	100	54,8	14,99
Physical age	10	90	57,8	14,49	16	100	57,9	11,44
Social age	15	83	57,6	12,97	16	90	56,3	12,36
Intellectual age	20	83	56,8	12,25	30	90	56,8	11,66
Cognitive-emotional age (delta)	-20	63	12,1	14,75	-42	47	9,76	12,67
Physical age (delta)	-20	58	8,5	12,47	-42	46	6,6	8,98
Social age (delta)	-7	45	8,7	10,41	-20	46	8,2	9,92
Intellectual age (delta)	-7	40	9,5	9,92	-20	38	7,7	8,84

Descriptive statistics show that there is slight difference between men and women in absolute values of subjective age. However, paying attention to the relative indicators (the deviation of subjective age from real one), we note that men tend to assess themselves older than their real age in all parameters. In general, retirees tend to evaluate themselves a little older than they are (somewhat overestimate their subjective age). These facts are confirmed by earlier studies [4], which also indirectly shows the validity of the methodology for the Russian-speaking elderly population.

4 Conclusion

The study allows to draw a conclusion about sufficient design and convergence validity, as well as the reliability of the questionnaire version for a sample of Russian-speaking retirees. The integrity of the construct of subjective age has been confirmed empirically: all its types have strong connections, form a single factor, with social and intellectual age playing a leading role in the structure of subjective age. Men and women retirees tend to overestimate their age slightly (estimate themselves older than they really are), with men overestimating their age more than women. In the adaptation version of the scale it is additionally proposed to consider the measure of deviation of subjective age from real one, which allows to compare the different age samples among themselves. The main advantage of this methodological tool is its compactness, simplicity of filling and processing, which makes it possible to apply it in large-scale research for the rapid diagnosis of subjective age. The results can be used, in particular, to improve the subjective well-being of older people [17].

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