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# Dynamics of the long-term orientation in Russian society over the past 100 years: results of the analysis of the Russian subcorpus of Google Books Ngram

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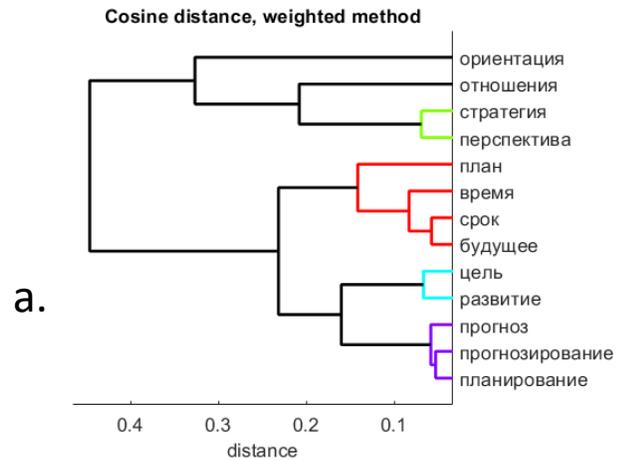
# Introduction

- Analysis of linguistic markers of cultural and macropsychological changes in the 1800s - 2000s is a growing stem of research (Greenfield, 2013; Yu et al., 2016; Younes, Reips, 2018; Solovyev et al., 2015; Velichkovsky et al., 2019; Grossmann, Varnum, 2015; Jackson et al., 2019; Hills et al. ., 2019; Lorenz-Spreen et al., 2019; Rautionaho et al., 2020; Bollen et al., 2021), however, in the field of corpus studies the long-term orientation as a cultural trait and its relationship with economic and demographic indicators hasn't been addressed.
- In our study methods of computational linguistics were used to shed light on the orientation towards long-term future as one of the characteristics of psychological state of society. We analyzed the dynamics of the use of nouns and verbs as semantic markers of long-term orientation in Russian-language texts of the 20th-21st centuries. The analysis was performed employing the third version of the Russian subcorpus of Google Books Ngram presented in 2020. To identify the main trends in frequency of use of the corresponding phrases, the method of principal components was used.



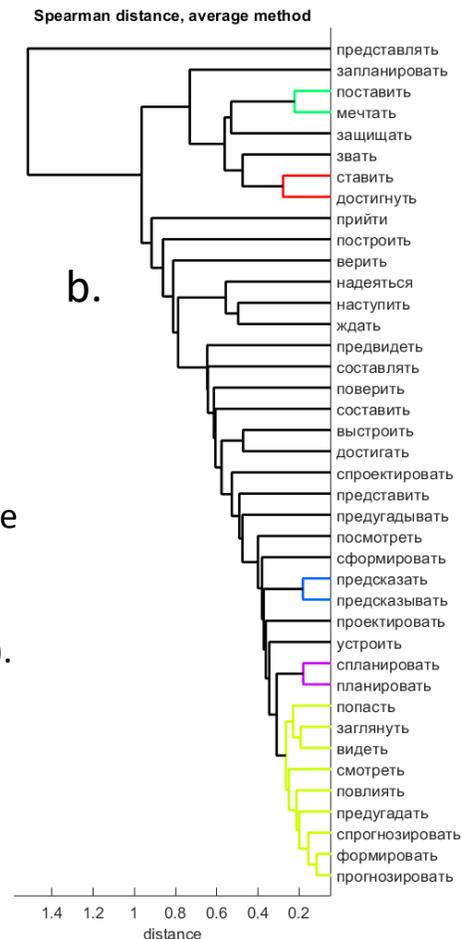
Google Books Ngram

# Objectives and Methods



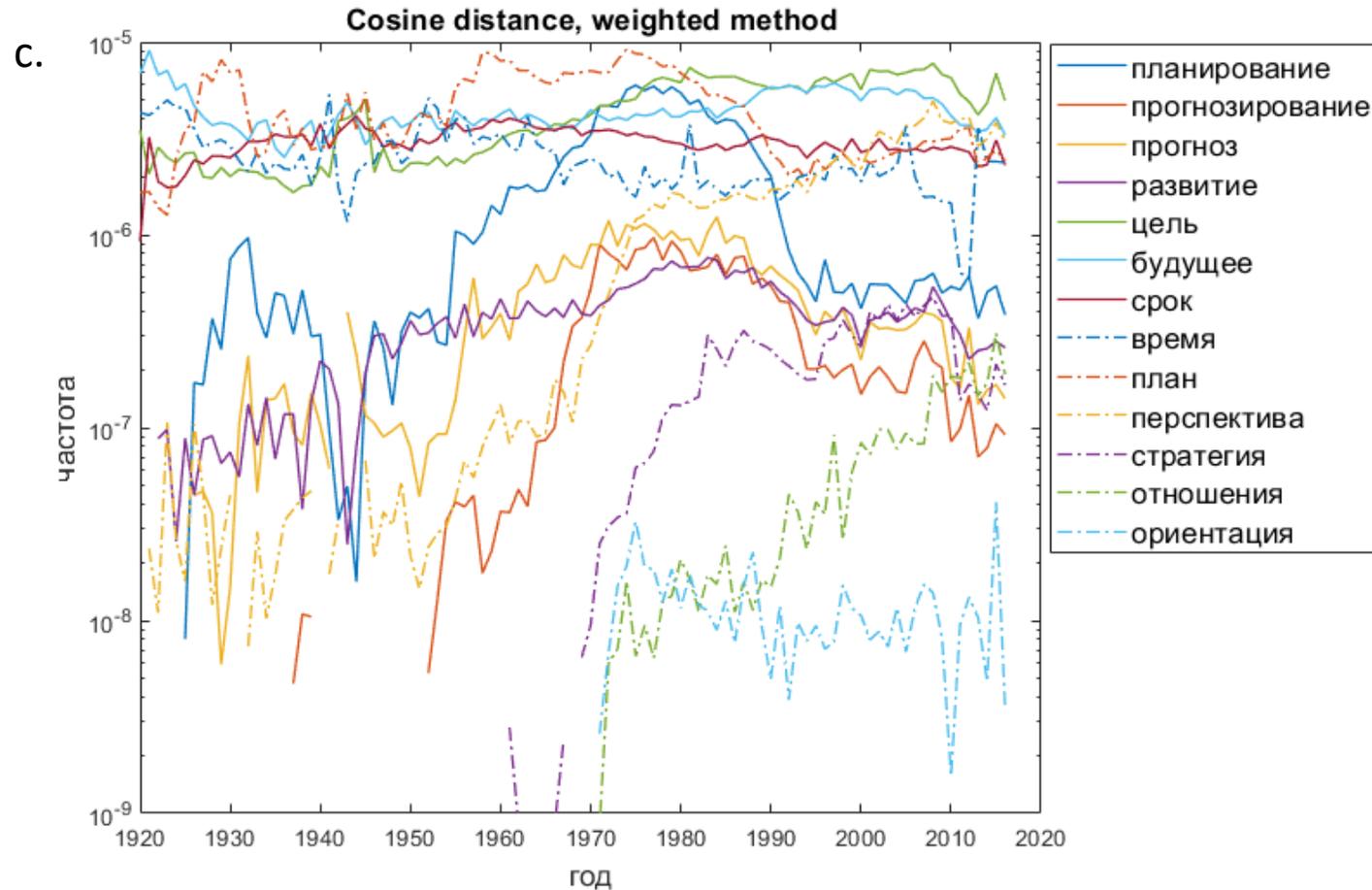
a. Results of a hierarchical cluster analysis of the frequency of use of nouns combined with the adjective "long-term" in 1920 - 2019 (based on the Russian subcorpus of Google Books Ngram).

b. Results of a hierarchical cluster analysis of the frequency of use of verbs with the semantics of long-term orientation in 1920-2019 (based on the Russian subcorpus of Google Books Ngram).



- The purpose of the study was to prove the relationship between markers of long-term orientation in Russian-language texts and socio-demographic dynamics in 1920 – 2019. We presumed that long-term orientation correlates positively with urbanization and economic development.
- The time series of frequencies extracted from the corpus were analyzed by means of cluster and factor analysis. We used hierarchical clustering (weighted averages), while the simple correlation distance, cosine distance, and Spearman correlation distance (one minus the Spearman correlation coefficient) were used as a measure of the difference between the series.
- The best results were obtained using the last of the indicated measures. We also used the principal component method to highlight the main trends in verb frequencies.

# The dynamics of the use of nouns and verbs as semantic markers of long-term orientation in Russian-language texts



c. Trends in the frequency of use of nouns with the semantics of long-term orientation in 1920 - 2019 (based on the Russian subcorpus of Google Books Ngram)

- For selected clusters, graphs of the total frequencies of verbs assigned to these clusters were found, which were then analyzed visually.
- Our analysis shows that since the mid-1970s, the frequency of the nouns "planning", "plan", "forecasting" and "forecast" in combination with the adjective "long-term" has decreased.
- The frequency of use of verbs with the semantics of long-term planning had decreased from the mid-1970s to the mid-1990s, and then grew until 2018.

# Correlation of linguistic markers of forecasting with socio-demographic dynamics

Demographic and economic indicators	Period	Group 1 "Forecasting" прогнозировать, спрогнозировать, видеть, заглянуть, повлиять, попасть, предугадать, смотреть, формировать	Group 2 "Planning" планировать, спланировать	Group 3 "Prediction" предсказывать, предсказать	Group 4 "Achieving" достигнуть, ставить	Group 5 "Dreaming" мечтать, поставить
Total fertility rate (per 1000)	1927-2014	Light Green	Light Green	Light Green	Light Green	Light Blue
Crude death rate (per 1000)	1927-2014	Light Green	Light Green	Light Blue	Light Green	Light Green
Total rate of natural increase	1927-2014	Light Green	Light Green	Light Green	Light Blue	Dark Blue
Total fertility rate	1927-2014	Light Green	Light Green	Light Green	Light Green	Light Blue
Total fertility rate of the urban population	1946-2014	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Light Blue
Total fertility rate of the rural population	1946-2014	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Light Blue
Life expectancy (male)	1927-2014	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue
Life expectancy (women)	1927-2014	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue
Total life expectancy	1946-2014	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Light Green
Share of urban residents in total population	1926-2014	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Light Blue
Per capita gross national income (1990\$)	1920-2012	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue
Per capita gross national income (1990\$)	1960-2012	Dark Blue	Dark Blue	Dark Blue	Light Green	Light Green

Positive correlation of linguistic markers of forecasting with the growth of the urban population, growth of per capita gross national income and overall life expectancy has been revealed.

At the same time, the frequency of use of the verbs with the semantics of hope is negatively related to fertility and life expectancy. It was found a negative correlation between total life expectancy and the frequency of use of the dreaming verbs.

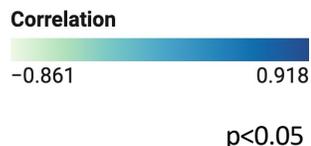


Table 1. Relationship between the use of verbs that have the semantics of long-term orientation and economic and demographic indicators

# Conclusion

The features of the dynamics of the use of dreaming verbs that we have discovered allow us to put forward a hypothesis about the compensatory nature of dreams in a crisis and their direct connection with the level of collectivism and generalized trust in society. The data obtained are consistent with other results of the analysis of linguistic markers of cultural changes in the 1800s–2000s: for example, an increase in socioeconomic status and an increase in tolerance for violations of the social order are associated with an increase in the level of individualism (Greenfield, 2013; Solovyev et al., 2015 ; Velichkovsky et al., 2019), focus on individual achievement (Grossmann, Varnum, 2015), creativity and scientific and technological development (Jackson et al., 2019).

Apparently, the urbanization and atomization of society strengthens the orientation towards forecasting and planning the individual future. It can be assumed that the experience of a collective threat and an orientation towards collectivistic values enhance the construction of a positive collective future that performs the functions of protecting a positive group identity.

Further research is needed to clarify the relationship between the various components of long-term orientation and the expression of individualistic and collectivistic values in culture.



ИНСТИТУТ ПСИХОЛОГИИ  
РОССИЙСКОЙ АКАДЕМИИ НАУК

# Thanks!

Do you have any questions?

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