

# Exploring Factors on the Difference of Life Expectancy between the Japanese Prefectures: the Application of the Method Using the Data Transformation by Ordinal Scale and Contraction

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In this paper, we explore the factors on the difference of life expectancy by age and gender between the Japanese prefectures using the data transformation method by ordinal scale and kernel cumulative probability distribution, the principal component and the kernel principal component based on the data from the Japanese Mortality Database, the government statistics and another statistical surveys. We conduct correlation analysis and regression analysis with these principal components by categories. We also consider the factors in relation to life expectancies based on the analysis.

In the principal component analysis, we confirm that the first principal component and the first kernel principal component are similar. As for the second and more order, some principal components are different from corresponding kernel principal components. In the regression analysis using the selection of explanation variables by stepwise, we can confirm that there are two cases, one of which is that the regression by the principal components as explanation variables has better fit, and the other of which is that the regression by kernel principal components as explanation variables has better fit. Through the principal components, the kernel principal components and the regression analysis, we find that some of the factors on the difference of life expectancy are related to marriage, divorce, household status and medical care.

Key words: life expectancy, socio-economic factors, data transformation, kernel principal component analysis, local area correlation analysis