

## THE STRUCTURE OF THE UKRAINIAN MUSICAL TASTE: EXPLORATORY LATENT CLASS ANALYSIS OF UKRAINIAN MUSICAL PREFERENCES

*This article is aimed at finding the latent structure of Ukrainian musical taste. Latent class analysis, likewise factor analysis, is a method which can be helpful to find the structure of a latent variable, such as taste, which stands behind patterns of responses to survey questions describing the preferences for some cultural goods, such as styles, genres, compositions, or performers. However, the biggest advantage of latent class analysis is that it can be applied to dichotomic and categorical variables. The article presents the findings of exploratory latent class analysis of musical preferences of Ukrainians. The results indicate there are three classes of musical taste in Ukraine: post-Soviet popular music taste, contemporary music taste, and omnivorous taste.*

**Keywords:** cultural sociology, musical preferences, musical taste, latent class analysis.

### Introduction

Methods of analysis have proved to be vital in finding the relation between the social structure and musical taste. Basically, three analytical strategies exist. Firstly, regression is often used as a means to find the relation between social variables and tastes. Secondly, as an alternative to regression equations, Multi-Correlation analysis was suggested, since culture is a multi-dimensional field which intersects with the multi-dimensional social structure [6]. Thirdly, researchers use classification methods, such as exploratory and confirmatory factor analyses, to define classes and levels of culture among the variety of cultural products evaluated by respondents [3]. Latent class analysis is suggested as an alternative to factor analysis because it does not require the interval variables, linear relation, and normal distribution [2]. Latent class analysis has been successfully used by Coulangeon and Roharik [2] to analyze cultural tastes.

Ukrainian studies of music mainly use traditional analytical strategies. Even though Ukrainian researchers of culture often have to deal with non-interval variables, non-linear relations, and non-normal distribution, especially dealing with the cultural taste, Latent Class Analysis has rarely, if ever, been used. Meanwhile, this method offers several important advantages, especially regarding the investigation of patterns of cultural consumption. The classification is based on the patterns of answers to the questions under analysis. So, it allows a researcher to classify the data on the basis of individual patterns of answers. Moreover, this

method, unlike factor analysis, is appropriate for the analysis of categorical, especially dichotomic, variables. The main purpose of this article, herein, is to introduce the method of latent class analysis using the example of the musical preferences of Ukrainians in 2008–2010. Exploratory latent class analysis of musical preferences is called to shed light on the latent structure of Ukrainians' musical taste. So, this article will be helpful to those researchers who are seeking for an alternative method of analysis of categorical data in Ukraine because it describes the procedures of this method using Mplus software. The article will be also interesting to those researchers who seek to understand the latent structure of culture and its transformation in a cross-country perspective.

### General Information about Latent Class Models

The main advantage of latent class models is that they do not only show the relation between variables, but also uncover one or more latent variables which may define a statistically significant relationship of those manifested variables [1, p. 4]. Specifically, latent class models can be applied to analyze hidden variables which determine relationships between dichotomous and polytomous variables [1, p. 5]. As Leo A. Goodman explains, "With the introduction of latent class models, we can examine whether these statistically significant apparent relationships and apparent effects might actually be spurious" [1, p. 5]. Another advantage of latent class analysis is that it makes it possible to classify the respondents by finding meaningful differences in the patterns of

their answers [4, p. 536]. This is especially valuable in the analysis of cultural preferences and tastes, since researchers focus on the culturally and socially shaped types of tastes which determine individual preferences and patterns of cultural consumption.

The decision to use latent class analysis on the data about music preferences of Ukrainians has been made for several reasons. Firstly, the available data about the music preferences of Ukrainians, provided by TNS is dichotomous. It includes questions about the preference of 16 music styles (in 2008) and 18 musical styles (in 2009 and 2010) with two answer options, “Yes” and “No”. Secondly, preliminary analysis of the patterns of musical preferences implies that there are several types of musical taste in Ukraine. Regarding the data considerations and need to check an assumption about the presence of latent “types of taste” which determine preference patterns, the use of Latent Class Analysis is suggested.

#### **Assumptions about the Latent Structure of Musical Taste of Ukrainians**

In nowadays’ social cultural studies, three main assumptions about the type of relation between cultural taste and the social structure exist. Elitists propose to look at culture as a dichotomy between the mass and elite taste [3]. The theory of social taste proposed by Bourdieu regards culture as a multi-dimensional space consisting of various fields where actors move depending on the volume of their social, cultural, and economic capital. Finally, findings of Peterson about omnivorous tastes in the USA are an argument for those social scientists who stand for individualization and blurred social, and, consequently, cultural borders.

Taking into account these theoretical approaches and preliminary analysis of the patterns of musical preferences of Ukrainians, several assumptions about the structure of musical taste in Ukraine can be made. First, there may be four classes of “pop-lovers”. First, those who listen only to modern or former popular music, such as disco of the 1960–80s. Secondly, there may be “omnivore listeners,” those who combine listening to pop music with listening to other kinds of music, such as rock, high, and the like. The third type of listeners, as Ukrainian data illustrates, are independent or “individual style listeners”. These assumptions are based on the fact that the vast majority of patterns of music preferences are unique, which means they occur in less than 3 % cases. All patterns that do not include pop music are substantially less frequent among Ukrainian music listeners. Finally, there also may be a fourth type of listeners who are more “neutral”

about music and are likely to moderately like most music styles.

#### **Application of Latent Class Analysis to the Musical Preferences of Ukrainians**

The analysis was performed on data for three years, 2008 through 2010, in an attempt to identify the latent class model which reflects the structure of Ukrainian music taste. A decision was made to analyze the available variety of musical genres, even though there are studies where the researcher united available musical genres into broader categories, such as pop, classical, or world music [2]. First of all, since the majority of patterns in the preliminary analysis contained popular music, it is worth understanding what popular music exactly they like or combine with other musical styles. Secondly, since the analysis is exploratory, it would be more theoretically valuable to analyze the full sets of musical styles typical for each of the identified classes. Such scrutiny might be helpful in understanding and describing the differences between the classes of musical taste.

The analyzed data were the three datasets of MMI study conducted by TNS that included responses of 5,000 city dwellers each, on their likes/dislikes of 16 musical styles in 2008, and 18 musical styles in 2009 and 2010. For each year, 10 latent class models, including 1 to 10 latent classes, were tested, compared, and evaluated according to the instructions of Asparouhov and Muthén [1] who provide theoretical argumentation and practical guidance on the most suitable way to define the number of latent classes. Mplus, version 6.12, was used to analyze the available datasets. Several model fit criteria were compared since deciding on the number of classes is one of the frequently discussed problems of latent class analysis [4, p. 537]. On the one hand, Adjusted Bayesian Information Criterion is seen as the best criterion to distinguish the number of classes [4, p. 537]. On the other hand, log likelihood difference test is widely spread, which, however, cannot be applied when the classes are nested [4, p. 537]. Another criterion which describes the classification quality and which was used for model evaluation is entropy.

#### **Results**

##### *Sample characteristics*

In 2008, most respondents were females (53.1 %). Their age ranged from 12 to 65 with the mean of 36.94 (SD = 15.153). In 2009, 53.2 % were females. The mean age was 37.16 (SD = 14.884).

In 2010, also 53.2 % of sample were females, and the mean age was 37.24 (SD = 14.904). As for the variables under analysis of preferences of music styles, the likes of participants were quite stable, without statistically significant differences between percentages in all three years. Table 1 illustrates the frequencies and percentages of participants who answered that they liked a certain style. As can be seen, in all three years, Russian pop music, music of previous years (the 1960s, 1970s, 1980s), foreign pop music, chanson, and Ukrainian pop music were the most frequently liked styles among the proposed ones.

its p-value was zero for any number of classes. Vuong-Lo-Mendell-Rubin likelihood ratio test was useful in some cases but its p-value was also zero for most models. Asparouhov and Muthén [1, p. 11] explain that this may happen if data under analysis is not specifically designed to indicate latent classes but the results still can be used as an approximate description of the latent classes and as a basis for further improvement of the model indicators. That is why other available criteria were also used to decide on the most appropriate number of latent classes in the model: log likelihood, adjusted Bayesian Information Criteria, and entropy.

Table 1. Musical preferences of participants in 2008, 2009, 2010

|     |   | 2008 |       | 2009 |       | 2010 |       |
|-----|---|------|-------|------|-------|------|-------|
|     |   | N    | %     | N    | %     | N    | %     |
| 1.  | Ukrainian pop music                     | 1458 | 30.5  | 1591 | 33.5  | 1585 | 34.1  |
| 2.  | Russian pop music                       | 2692 | 56.4  | 2637 | 55.5  | 2652 | 57.1  |
| 3.  | Foreign pop music                       | 1755 | 36.7  | 1773 | 37.3  | 1773 | 38.2  |
| 4.  | Ukrainian rock music                    | 507  | 10.6  | 612  | 12.9  | 513  | 11.0  |
| 5.  | Russian rock music                      | 1050 | 22.0  | 987  | 20.8  | 1031 | 22.2  |
| 6.  | Foreign rock music                      | 1204 | 25.2  | 1260 | 26.5  | 1170 | 25.2  |
| 7.  | Bard songs                              | 587  | 12.3  | 683  | 14.4  | 590  | 12.7  |
| 8.  | Jazz                                    | 350  | 7.3   | 446  | 9.4   | 416  | 9.0   |
| 9.  | Classical music                         | 994  | 20.8  | 1018 | 21.4  | 974  | 21.0  |
| 10. | Club music                              | 837  | 17.5  | 888  | 18.7  | 933  | 20.1  |
| 11. | Theatre and cinema music                | 826  | 17.3  | 919  | 19.3  | 904  | 19.5  |
| 12. | Folk music                              | 715  | 15.0  | 751  | 15.8  | 699  | 15.0  |
| 13. | Music of previous years (60s, 70s, 80s) | 1928 | 40.4  | 2000 | 42.1  | 1945 | 41.9  |
| 14. | Techno, rave, house, etc.               | 346  | 7.2   | 323  | 6.8   | 399  | 8.6   |
| 15. | Shanson                                 | 1669 | 34.9  | 1846 | 38.8  | 1834 | 39.5  |
| 16. | Other                                   | 456  | 9.5   | 446  | 9.4   | 437  | 9.4   |
| 17. | R'n'B (only in 2009, 2010)              | -    | -     | 521  | 11.0  | 557  | 12.0  |
| 18. | Hip-hop/ Rap (only in 2009, 2010)       | -    | -     | 592  | 12.5  | 657  | 14.1  |
|     | Total                                   | 5000 | 100.0 | 5000 | 100.0 | 5000 | 100.0 |

#### *Extraction of Latent Classes*

Indicators of latent class analysis were 18 music styles (except for 2009 where preferences of 16 music styles were collected): Ukrainian pop music, Russian pop music, foreign pop music, Ukrainian rock music, Russian rock music, foreign rock music, bard songs, jazz, classical music, club music, theatre and cinema music, folk music, music of previous years (1960s, 1970s, 1980s), techno, rave, house, etc., chanson, other, R'n'B and hip-hop/ rap (added in 2009 and 2010).

To choose the model which best describes musical taste of Ukrainians, latent class analysis was conducted assuming 2–10 classes for each of the three years. One of the suggested criteria (parametric bootstrapped likelihood ratio test for  $k-1$  ( $H_0$ ) versus  $k$  classes) has not turn to be a useful indicator of the number of latent classes in the model because

Concerning log likelihood, in all the three years when the estimated number of classes was 9 or more, it was impossible to calculate the best log likelihood because the solutions reached the local maxima. Even substantial increase in the number of random starts perturbations advised by Asparouhov and Muthén [1, p. 7] did not result in more trustworthy solutions. So, the models with more than 8 classes are considered not to be trustworthy.

As can be seen in Figure 1 which shows log likelihood plot for the three analyzed datasets, in all cases there was a leap in log likelihood when more than 1 class was estimated, which is an argument for the presence of latent classes in the patterns of answers. Based on log likelihood change, the 3-class solution is the most suitable for the three datasets.

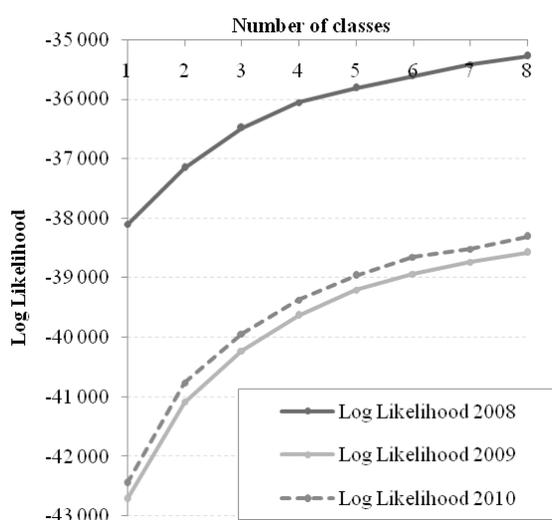


Fig. 1. Log Likelihood plot for the estimated number of latent classes

However, when adjusted Bayesian Information Criteria (ABIC) was taken into account, 4-class solution turns to be that edge when ABIC becomes quite stable, implying that the models do not change significantly after exceeding 4 classes.

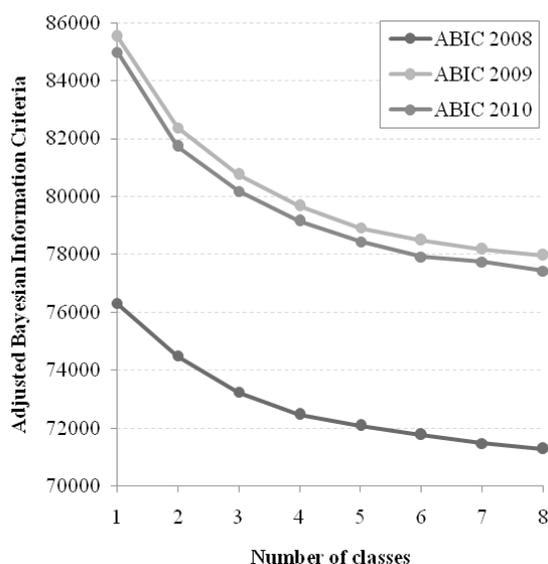


Fig. 2. Adjusted Bayesian Information Criteria plot for the estimated number of latent classes in the model

Figure 1 and Figure 2 illustrate that 2008 data modelling results are different from 2009 and 2010, the years which were more consistent between each other. This difference must be due to the difference in the composition of music preferences in 2008. While in 2008 respondents were proposed 16 music styles, in 2009 and 2010 they were also asked about two more styles: R'n'B and hip-hop/rap. Since these two styles belong to contemporary music, their presence might add more quality to the classifications. Based on entropy values, 4-class models had one of the highest

qualities of classification. However, entropy values grew non-linearly and, for some models, were misleading. Moreover, even though the 4-class models were similar in three years, one of the extracted classes had different composition from year to year.

So, a decision to choose the 3-class model of musical taste was due to the above mentioned criteria. Besides, when more than 5 classes were tested, it became more and more difficult to reach optimal solutions and the best log likelihood. Finally, 3-class models have similar composition in all three analyzed cases.

### Comparison of Classes

All the three extracted latent classes include people with high probability of preference for popular music styles, be it Ukrainian, Russian, or foreign pop. Even though this finding can sound evident because popular music is popular thanks to its scope of lovers, it contradicts the main argument of elitists because the results show there is no divide between mass and elite culture, in the traditional understanding of both. The main division becomes clearer if the two-class models are considered: there is a difference between omnivores and pop lovers, which is between people who listen predominantly to various kinds of popular music, and between people who combine taste for popular with classical music.

The latent class of post-Soviet pop taste was named so because it includes people with high probability of preferences for Russian pop music, music of previous years and chanson music. The second latent class was named contemporary music taste. In a similar manner, it includes people who listen to different kinds of popular music, Russian and foreign rock, as well as club music, R'n'B, and hip-hop / rap, which are quite new musical styles for the Ukrainian audience. The latent class which can be described as omnivorous taste also reoccurs in all years. Listeners who have this kind of taste, in line with the definitions of Peterson [5], manifest preferences for different pop and rock music, to former popular culture, and to musical styles which can be regarded “high”, such as classical music, jazz, bard songs, and cinema and theatre music. Table 3 presents probabilities of people who like certain styles to belong to a certain latent class.

Taking into account the composition of classes, they were named “post-Soviet pop taste,” “contemporary music taste,” and “omnivorous taste.” As can be seen in Table 2, which shows the classification of individuals based on latent class membership, post-Soviet pop taste is the most numerous class of taste in all three years, while omnivorous taste is the least numerous.

Table 2. Probability of belonging to three classes of taste in 2008–2009 based on music preferences

|   | Post-Soviet Pop Taste |       |       | Contemporary Music Taste |       |       | Omnivorous Taste |       |       |
|---|-----------------------|-------|-------|--------------------------|-------|-------|------------------|-------|-------|
|   | 2008                  | 2009  | 2010  | 2008                     | 2009  | 2010  | 2008             | 2009  | 2010  |
| Ukrainian pop music                     | 0.156                 | 0.262 | 0.234 | 0.274                    | 0.23  | 0.307 | 0.687            | 0.67  | 0.693 |
| Russian pop music                       | 0.387                 | 0.469 | 0.434 | 0.553                    | 0.484 | 0.591 | 0.897            | 0.834 | 0.819 |
| Foreign pop music                       | 0.04                  | 0.211 | 0.173 | 0.549                    | 0.544 | 0.585 | 0.688            | 0.716 | 0.673 |
| Ukrainian rock music                    | 0.046                 | 0.053 | 0.021 | 0.112                    | 0.144 | 0.16  | 0.22             | 0.39  | 0.333 |
| Russian rock music                      | 0.113                 | 0.098 | 0.099 | 0.26                     | 0.272 | 0.33  | 0.344            | 0.518 | 0.418 |
| Foreign rock music                      | 0.042                 | 0.106 | 0.083 | 0.399                    | 0.485 | 0.461 | 0.38             | 0.564 | 0.428 |
| Bard songs                              | 0.139                 | 0.124 | 0.102 | 0.039                    | 0.013 | 0.022 | 0.248            | 0.351 | 0.375 |
| Jazz                                    | 0.035                 | 0.047 | 0.039 | 0.055                    | 0.072 | 0.08  | 0.195            | 0.289 | 0.279 |
| Classical music                         | 0.199                 | 0.163 | 0.147 | 0.095                    | 0.118 | 0.118 | 0.445            | 0.487 | 0.55  |
| Club music                              | 0.026                 | 0.05  | 0.048 | 0.308                    | 0.534 | 0.471 | 0.201            | 0.25  | 0.215 |
| Theatre and cinema music                | 0.192                 | 0.169 | 0.161 | 0.026                    | 0.031 | 0.056 | 0.429            | 0.445 | 0.514 |
| Folk music                              | 0.193                 | 0.143 | 0.122 | 0.016                    | 0.017 | 0.02  | 0.315            | 0.353 | 0.454 |
| Music of previous years (60s, 70s, 80s) | 0.496                 | 0.407 | 0.385 | 0.149                    | 0.157 | 0.212 | 0.663            | 0.687 | 0.759 |
| Techno, rave, house, etc.               | 0                     | 0.001 | 0.009 | 0.145                    | 0.259 | 0.232 | 0.068            | 0.08  | 0.082 |
| Shanson                                 | 0.402                 | 0.39  | 0.392 | 0.223                    | 0.19  | 0.242 | 0.42             | 0.516 | 0.506 |
| Other                                   | 0.057                 | 0.071 | 0.065 | 0.127                    | 0.117 | 0.11  | 0.095            | 0.129 | 0.138 |
| R'N'B (only in 2009, 2010)              | -                     | 0.006 | 0.003 | -                        | 0.396 | 0.339 | -                | 0.137 | 0.121 |
| Hip-hop / Rap (only in 2009, 2010)      | -                     | 0.013 | 0.011 | -                        | 0.443 | 0.384 | -                | 0.139 | 0.143 |

Table 3. Classification of individuals based on their most likely latent class membership

|                          | 2008 |       | 2009 |       | 2010 |       |
|--------------------------|------|-------|------|-------|------|-------|
|                          | N    | %     | N    | %     | N    | %     |
| Post-Soviet Pop Taste    | 2354 | 47.1  | 3407 | 68.1  | 3081 | 61.6  |
| Contemporary Music Taste | 1912 | 38.3  | 883  | 17.7  | 1303 | 26.1  |
| Omnivorous Taste         | 734  | 14.7  | 710  | 14.2  | 616  | 12.3  |
| Total                    | 5000 | 100.0 | 5000 | 100.0 | 5000 | 100.0 |

### Conclusions

Exploratory latent class analysis has provided valuable findings which help to understand the structure of the Ukrainian musical taste. These findings also add to contemporary understanding of the culture showing that the taste for popular culture dominates in Ukraine. Not only are the classes of post-Soviet and contemporary pop lovers the most numerous, the third class of omnivores also demonstrate preferences for popular culture. Latent class analysis has indicated that omnivorous taste in Ukraine includes preferences for many musical

styles and is indeed broad. These findings provide the basis for further analysis of the relation between the social structure and music in Ukraine. Now that classification of musical taste has been made with the application of latent class analysis, the extracted classes and their relation to social-demographic and other variables can be evaluated. However, latent class analysis has appeared to provide misleading results when the variables under analysis had not been specifically designed as indicators of a latent variable. In further research, if this method is used, the variables should be designed as indicators of a latent variable.

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### **СТРУКТУРА УКРАЇНСЬКОГО МУЗИЧНОГО СМАКУ: ЕКСПЛОРАТОРНИЙ ЛАТЕНТНО-КЛАСОВИЙ АНАЛІЗ МУЗИЧНИХ УПОДОБАНЬ УКРАЇНЦІВ**

*Цю статтю присвячено пошуку латентної структури музичного смаку українців. Латентно-класовий аналіз, подібно до факторного аналізу, є тим методом, за допомогою якого можливо виявити структуру латентної змінної, наприклад, смаку, котра стоїть за патернами відповідей на набір запитань в опитуванні, які стосуються вподобання певних продуктів культури: стилів, жанрів, творів або виконавців. Однак головною перевагою латентно-класового аналізу є можливість його застосування до дихотомічних або інших категоріальних змінних. У цій статті представлено результати латентно-класового аналізу музичних уподобань українців. Отримані результати вказують на те, що структура музичного смаку українців протягом трьох досліджуваних років (2008–2010) була досить сталою та включала три основні різновиди музичного смаку: пострадянський смак до популярної культури, смак до сучасної популярної культури та всеїдний смак. Найпоширенішим є пострадянський смак до популярної музики, який включає вподобання російської популярної музики разом із музикою минулих років (60-ті, 70-ті, 80-ті) та шансоном. Другим за поширенням є смак до сучасної популярної музики, представники якого слухають українську, російську та зарубіжну поп-музику, російську та зарубіжну рок-музику, клубну музику, R'n'B та хіп-хоп/реп. Частина музичних слухачів можна охарактеризувати як «всеїдних», оскільки вони поєднують уподобання популярної музики із вподобанням класичної, музики театру та кіно та бардівської пісні. Таким чином, застосування експлораторного латентно-класового аналізу вказує на наявність трьох основних видів смаку в українських слухачів музики, хоча ці результати мають бути валідизовані в майбутньому.*

**Ключові слова:** соціологія культури, музичні вподобання, музичний смак, латентно-класовий аналіз.

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