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## Cause-effect relationships between objective and subjective measures of quality of life in Lithuania municipalities

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### Abstract

The Quality of Life (QoL) in the local place concept anticipates that overall individually perceived QoL is being constituted both by objective local living conditions as well as subjective individual experience and evaluation of these local place's external QoL factors. However, the mathematical-statistical research based scientific evidences about some certain context related direction and strength of relationships between objective local place related conditions (as a cause side) and subjective QoL perception (as an effect side) are lacking. By taking into account specific characteristics, i.e. the extent and nature of the data available to measure the objective and subjective QoL, the article explores methodological possibilities to model statistically probable cause-effect relationships established and empirically observed in Lithuania municipalities'. Such statistical probability based cause-effect models would be extremely valuable in building and justifying empirical observation based and any single municipality local place context relevant QoL improvement strategies.

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### 1. Introduction

It is already generally agreed that both sides, i.e. objective locally built potential to support, sustain and fulfil human needs, along with respective subjective individual experience of these needs fulfilment simultaneously form the QoL in the local place phenomenon (e.g. Pukelienė & Starkauskienė, 2011). Despite this general conceptual

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agreement, according to Pukelienė & Starkauskienė (2011) and some other authors, there still is no single method of quality of life measurement, which would be grounded methodologically and accepted generally. Instead, considering methodological soundness, QoL remains a contested concept, which is measured in different ways (Noll, 2002; Marans & Stimson, 2011).

Most of local place related Quality of Life measurement instruments in this perspective are constructed as simple weighted average calculation based indexes built by selecting a range of sound appropriate and relevant indicators and applying to them experts' opinion research based factors' weightings. Such mathematical index calculation method seems to be appropriate for quality of life measurements (Pukelienė & Starkauskienė, 2011; Starkauskienė, 2011), but only when the aim of QoL investigation is limited to the goals of comparison, ratings development and general evaluation. When the research problem turns to the idea of building and grounding certain context specific strategy for QoL improvement, weighted indexes comparing several investigated places (i.e. cities, municipalities regions, etc.) are not sufficient. Weighted index based QoL measurements do not provide any information about empirically observed (not experts' subjective opinion based) relationships between objective living conditions in local place environment and respective subjective QoL perceptions. Management of objective conditions here thus is seen as most clear and straight forward way to impact QoL subjectively perceived by local individuals.

The aim of the research is to estimate possibilities to analyse empirically observed effects of objective local place conditions on the subjectively evaluated individual QoL in Lithuania municipalities. The aim will be achieved by completing two tasks: namely, 1) by investigating methodologies used to analyse cause-effect relationships in QoL research and 2) by judging on the possibilities to apply these methods, considering the particular character, i.e. extent and nature of the data available to measure QoL in local places, i.e. Lithuania municipalities. The main methods of the present research are literature review and descriptive statistical analyses.

The relevance and necessity of the research is being reasoned with the reference to the conclusions provided by McCrea, Stimson and Marans (2011), who noticed, that very often and across wide range of different countries local place strategic development policy statements are based on the assumptions that improvements in the objective indicators of QoL are seen as associated by cause-effect relationships with improvements in the expected subjective experience of QoL, but these statements are made when little is actually known about the existence and strength of these associations. The presence and strength of these cause-effect relationships needs first to be empirically confirmed in order to validate inferences from objective condition to subjective QoL perception. According to McCrea, Stimson and Marans (2011), somewhat surprisingly, relatively little work has still been done to empirically test the links between subjective satisfaction with living in some particular local place and objective characteristics of the urban or regional environment. The article explores possibilities to measure cause-effect relationships between objective and subjective measures of QoL in Lithuania municipalities and establishes respective methodological framework. In short, the essence of the article is to find out how above just mentioned cause-effect relationships should be measured in the case of Lithuania municipalities, considering available data.

## **2. Method**

The present research is aimed at developing the methodology to explore empirically observed cause-effect relationships between objective QoL conditions in a local place and subjective individual QoL perception in Lithuania municipalities. Following theoretical statements provide general conceptual background, derived by reviewing scientific literature. The objective QoL is the quality measured by means of objective social and economic indicators without recourse to personal experience and individual perceptions of environment. Subjective individual QoL is the perception of well-being and evaluation of individuals own position in life based on experience of living in some particular local place. The main object of the studies of objective QoL is an external environment – i.e. livability of investigated local place. On the other hand, studies of subjective QoL focus on individual experience, which is often measured by means of qualitative methods – i.e. questionnaires and surveys (Diener, & Suh, 1997; Pukelienė, & Starkauskienė, 2011, Malkina-Pykh & Pykh, 2008, etc.).

It is also assumed broadly in the literature that overall individually perceived QoL is made of a set of latent variables. The values of these latent variables are expected to be dependent on the objective conditions in the local place environment (formative QoL approach). On the other hand, empirically observed subjectively evaluated indicators are seen as dependent on the values of latent variables (reflective QoL approach). In this perspective, by

following Maggino and Zumbo (2012), it is concluded that observed dependent variables (i.e. subjectively evaluated QoL) depend on (or are caused by) the independent ones (which are observed by using objective measures) but indirectly and through the set of latent variables, which are hidden in people's perception, experience, their own understanding of local place QoL.

Finally, QoL improvement strategy building perspective (Rybakovas, Liugailaitė-Radzvickienė & Šajeva, 2012) states that QoL improvement strategies focus on the opportunities to address objective aspects in the first order and only if objectively measured QoL is sufficient, comparing to the overall context, then more sophisticated tools to manage subjective experiences are proposed. It is assumed that changes of objectively measured QoL will perform as causes altering subjective QoL evaluations, which are projected as final visionary results of QoL improvement strategies implementation.

The literature review based research reveals that while linking objective and subjective measurements of QoL in local place, in order to estimate cause-effect relationships and then model plausible consequences of management of objective QoL aspects, following methodological issues are addressed:

- Each of the proposed latent variables of QoL in local place, designed to link independent objective and dependent subjective indicators, and thus included in the conceptual QoL framework first must be grounded with certain respective theory. McCrea, Marans, Stimson and Western (2011) as well as McCrea, Stimson and Marans (2011) point to the range of following concepts and theories: access to services and local facilities approach, optimum centrality theory, urban density and overloading, natural environments, social disorganization theory, subculture theory, residential location theories, etc. Other concepts aiming to analyse subjective QoL or any single aspect of subjective well-being in respect to some objective aspects are also relevant.

- Theoretically supported relationships are operationalized with objective and subjective QoL manifesting indicators. Objectively measured characteristics of the local places are used to predict subjective perceptions which are reflected in subjective evaluations of considered QoL in local place aspect. The exact structure of such operational model is being determined by the indicators, available in the context of any particular research.

- Following Maggino and Zumbo (2012) and Fayers and Hand (1997, 2002), proposed hypotheses about causal relationships between objective and subjective measures are tested using structural equation modelling or other appropriate statistical methodology. Given its specific assumptions, this approach can be adopted only in the presence of a strong conceptual interpretative framework concerning the causal relationships between objective and subjective indicators. It requires a strong acceptance of the direction of the relationships among objective and subjective measures.

### 3. Results

Following above just described methodological steps, the respective concept is applied to build indicators' system for the QoL in Lithuania municipalities' measurement. The main problem in constructing system of QoL indicators that cover objective and subjective measures is the obvious shortage of available subjectively measured secondary data. If the national level is covered with broader range of internationally conducted surveys, then the local (i.e. municipalities based) level is investigated particularly rarely, though most of basic factors that impacts QoL emerge mainly at the local living level – i.e. in the city or region.

QoL in Lithuania municipalities indicators' system is constructed using objective measures provided by Statistics Lithuania (<http://www.stat.gov.lt/en/>) and subjective measures taken from the European Social Survey (ESS) database (<http://www.europeansocialsurvey.org/>). Objective measures cover the year 2011. Subjective measures are obtained during the 5th round of ESS survey conducted in Lithuania through May to August 2011 (Policy and Public Administration Institute at Kaunas University of Technology, 2013).

According to the conceptual model of QoL in local place improvement strategy building (Rybakovas, Liugailaitė-Radzvickienė & Šajeva, 2012), the system is composed of three groups of subjective and objective indicators covering material QoL, social and emotional QoL as well as physical and productive QoL. The calculated values of separate indicators within the single group are aggregated as simple average to obtain averaged value for whole indicators' group. The calculated indicators' values (which are used for indexing and rating municipalities according to the QoL level) were got by comparing municipality indicator value with the average value among all Lithuania

municipalities of the same indicator. Positive calculated index values show that the value of certain indicator in respective municipality is higher than average by the calculated percentage. Negative values reveal that QoL in the terms of respective indicator or the group of them is lower if compared to the Lithuania municipalities' average. It means that positive index value show higher, negative – lower QoL, no matter is it evaluated by objective or subjective measurements. The total number of 78 indicators is used, 39 among them are objective and remaining – subjective QoL measures.

As cause-effect relationships investigation methodology anticipates, first of all purely descriptive approach is applied. Table 1 contains data on calculated and averaged indexed values within six groups QoL indicators' for selected municipalities. Since only largest municipalities were surveyed during ESS 5th round with some representative amount of responses (ranging between 50 and 200 respondents), the Table 1 illustrates only these cases. Other cases are considered as statistically not representative.

Table 1. Objectively and subjectively measured Quality of Life in selected Lithuania municipalities, 2011

Selected	Objective QoL				Subjective QoL				Overall QoL index
	Material	Social-emotional	Physical-productive	General objective	Material	Social-emotional	Physical-productive	General subjective	
Alytus city	-2.732	22.315	1.406	8.387	4.894	5.857	4.250	5.015	6.745
Kaunas city	16.447	-2.690	-31.484	-8.119	1.895	-0.800	3.570	1.458	-3.393
Kaunas district	-16.325	-10.860	17.468	-2.092	2.642	4.730	4.415	3.846	0.799
Klaipėda city	12.582	-1.514	-32.990	-9.198	-0.734	-5.063	-0.268	-2.080	-5.685
Panevėžys city	-11.724	2.627	-23.491	-10.428	-1.016	7.177	0.196	2.138	-4.227
Panevėžys district	-20.796	0.807	-5.474	-7.192	3.990	10.960	5.911	6.931	-0.131
Šiauliai city	-12.592	1.625	18.442	4.016	0.855	-9.380	2.545	-2.157	0.970
Ukmergė district	-7.578	-8.354	2.461	-4.273	-8.783	-4.194	-8.996	-7.275	-5.754
Vilnius city	98.157	15.181	15.879	37.274	3.922	-1.418	-1.654	0.481	18.878

As it is observed, calculated objective and subjective averaged QoL index values do not show any common pattern and possible cause-effect relationships like are every single context specific phenomena.

Descriptive analyses of objectively and subjectively measured QoL in Lithuania municipalities in line with theoretical concepts might be used to establish hypothesis of plausible relationships structures between different measures. However, limited number of representative cases does not allow performing statistical probabilistic evaluation of the structural models. In order to reveal statistically significant relationships between objective and subjective indicators, continuing observations are necessary. Although ESS in Lithuania is conducted continually (data of two survey rounds already is available), changes between the year 2009 and 2011 are impossible to observe because ESS questionnaires are changing from round to round and only part of the indicators relevant to measure QoL are used permanently. The data from the ESS 4th round is not broken down by municipalities. It is concluded that there are limited possibilities to investigate cause-effect relationships between objective and subjective QoL in Lithuania municipalities.

#### 4. Discussion/Conclusions

The article outlines the research methodology to investigate cause-effect relationships between objective and subjective QoL in local place measurements and applies it in the case of Lithuania municipalities. The article concludes with representation and discussion of theoretically substantiated system of plausible cause-effect relationships between objective and subjective QoL indicators in Lithuania municipalities and list of respective hypotheses. The specific structure of the system of expected cause-effect relationships is based on the indicators that already are measured and data is available from secondary sources. However the possibilities to apply exploratory statistical methods are limited due the misbalance in extensiveness between objectively and subjectively measured data. Difficulties and thus limitations of the statistical exploratory research (intended to investigate empirical cause-effect relationships) conducting statistical testing of the model are conditioned by the nature of European Social Survey data. These limitations occur because the data collected in Lithuania during the 4th round of the ESS survey (Policy and Public Administration Institute at Kaunas University of Technology, 2010) is not broken down by the

respondent's municipality indicator. The range of ESS indicators is changing from round to round and only small number of them among those relevant to measure QoL is measured continually. Most of the smaller municipalities are represented with the very few respondents in the 5th round (Policy and Public Administration Institute at Kaunas University of Technology, 2013) of the ESS survey. Since structural equation modelling tests relationships by calculating correlations (Fayers & Hand, 1997, 2002), the set of objective and subjective data available in Lithuania is not appropriate for such intends. Only preliminary descriptive analysis is available.

## References

- Diener, E., & Suh, E. M. (1997). Measuring quality of life: economic, social, and subjective indicators. *Social Indicators Research*, 40, 189-216.
- Fayers, P. M., & Hand, D. J. (1997). Factor analysis, causal indicators and quality of life. *Quality of Life Research*, 6, 139-150.
- Fayers, P. M., & Hand, D. J. (2002). Causal variables, indicator variables and measurement scales: an example form quality of life. *Journal of Royal Statistical Society*, 165, 233-261.
- Maggino, F. & Zumbo, B. D. (2012). Measuring the quality of life and the construction of social indicators. In K. C. Land, A. C. Michalos, M. J. Sirgy (Eds.), *Handbook of social indicators and quality of life research* (pp. 201-238). Springer Science+Business Media.
- Malkina-Pykh, I. G., & Pykh, Y. A. (2008). Quality-of-life indicators at different scales: Theoretical background. *Ecological Indicators*, 8, 854-862.
- Marans, R. W., & Stimson, R. J. (2011). An overview of quality of urban life. In R. W. Marans, R. J. Stimson (Eds.). *Investigating quality of urban life: Theory, methods and empirical research: social indicators research series*, 45 (pp. 1-32). Springer.
- McCrea, R., Marans, R. W., Stimson, R., & Western, J. (2011). Subjective measurement of quality of life using primary data collection and the analysis of survey data. In R. W. Marans, R. J. Stimson (Eds.). *Investigating quality of urban life: Theory, methods and empirical research, Social indicators research series*, 45 (pp. 55-76). Springer.
- McCrea, R., Stimson, R. & Marans, R. W. (2011). The evolution of integrative approaches to the analysis of quality of urban life. In R. W. Marans, R. J. Stimson (Eds.). *Investigating quality of urban life: Theory, methods and empirical research, Social indicators research series*, 45 (pp. 77-106). Springer.
- Noll, H. H. (2002). Towards a European system of social indicators: Theoretical framework and system architecture. *Social Indicators Research*, 58, 47-87.
- Policy and Public Administration Institute at Kaunas University of Technology. (2013). ESS5, Main and supplementary questionnaire data, Lithuania, May - August 2011. Distributor LiDA. Available from LiDA database. <http://www.lidata.eu/en/>
- Policy and Public Administration Institute at Kaunas University of Technology. (2010). ESS4, Main and supplementary questionnaire data, Lithuania, October 2009 - January 2010. Distributor LiDA. Available from LiDA database. <http://www.lidata.eu/en/>
- Pukelienė, V., & Starkauskienė, V. (2011). Quality of life: Factors determining its measurement complexity. *Inžinerine ekonomika-Engineering Economics*, 22, 147-156.
- Rybakovas, E.; Liugailaitė-Radzvickienė, L.; & Šajeva, S. (2012). Objectively measured quality of life: the case of Lithuanian municipalities. *Social Sciences / Socialiniai mokslai*, 4, 7-21.
- Starkauskienė, V. (2011). *Quality of life factors and its integrated measurement model* (Summary of Doctoral Dissertation). Kaunas: Vytautas Magnus University.