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Overview of Quality of Life in Europe

Antonella D'Agostino, Giulio Ghellini, María Navarro, Angeles Sánchez

1. Introduction

In the last decades, Quality of Life (henceforth QoL) has increasingly become a key issue for modern society and one of the most important goals to be looked for by individuals. QoL implies, firstly, that the minimal conditions required for humans to thrive are met and, secondly, that the fit between opportunities and capacities is sufficient (Veenhoven, 2000). The process started in the more advanced democracies, replacing the mere search for material wealth, and putting at the top of the public agenda new challenges for social organisation and social policy. Within this framework, several international initiatives have been undertaken to improve the measuring of QoL (for a review, see Sánchez et al., 2018). In the context of the European Union (EU), the European Commission initiated 2009 the action "GDP and Beyond. Measuring progress in a changing world" starting from the idea that economic indicators, such as the Gross Domestic Product (GDP), while important, do not tell us completely the effective status of the well-being of a population and, consequently, how well we are operating (EU Commission, 2009**)**.

Accordingly, the need to enrich the information provided by GDP with new data on other aspects of people's lives becomes a key issue and challenge for researchers, institutions, and policymakers. In this vein, a great consensus arises towards the need to develop new data sources and new surveys for building innovative indicators of QoL, useful for measuring progress in societies from a different perspective (Mercy, 2015). These indicators should reflect the multidimensionality of the concept of QoL and, therefore, must cover the individuals' conditions that contribute to living a good life, such as living standards, social relationships, leisure and culture, good health, education, the environment, etc. (Michalos et al., 2011). The relevance and the complexity of the measurement of QoL stimulated different methodological and empirical research in the last years, so in addition to the already established journal *Social Indicators Research* since 1974, they have joined *The Journal of Happiness Studies* in 2000 and *Applied Research in Quality of Life* in 2006 (McCrea et al., 2011).

In this Chapter, we focus on the measurement of QoL in Europe, considering that QoL is a latent concept that can be studied as a formative measurement model. That is, QoL is assumed to be defined by a set of indicators, both: i) objective or social indicators that reflect people's objective circumstances in each cultural or geographical area, and ii) subjective well-being indicators that instead reflect an individual's judgment of his well-being (Diener & Suh, 1997). Our main aim is to show the utility of applying a fuzzy set approach in this framework, using micro-data collected through survey data.

The rest of this contribution is structured as follows. Section 2 presents a brief literature review concerning the measurement of QoL and its development in the last years. Section 3 outlines the surveys generally used for monitoring QoL in Europe, as well as the main results of some empirical

studies. Section 4 briefly describes the fuzzy methodology proposed by Betti et al. (2015) for building composite indicators of QoL by showing how this approach can be considered a useful methodological tool in this framework. Finally, some conclusions end the Chapter in Section 5.

2. Measuring Quality of Life: literature review

Over time, the global community has been moving towards conceiving well-being or QoL[1] from a narrow economic conception to encompass objective circumstances of the person and his/her subjective evaluation of these circumstances. In this Section, we review, chronologically, the main approaches to address the study of people's QoL.

The dominant conception of well-being in the second post-war development period has been an economic one. The conditions determining the development of countries were defined based on production in the highest possible monetary terms and the modification of productive activities when they were harmful to citizens. Economic welfare focuses on the material resources people control, can utilize, and dispose of, measured by income and at aggregate levels by national income or product per head (Gough et al., 2007). However, since the fifties-sixties, some of the most respected economists were aware of the limits of GDP as a proxy of QoL. It was not only a critique of the use of a single indicator to assess social performance, but also about the economic nature of the indicator used (see, for instance, Galbraith, 1958; Mishan, 1967; Scitovsky, 1976; Sen, 1976).

In this context, from the seventies, the Social Indicators Movement (Andrews & Withey, 1976) argued in favour of measuring the QoL broadly construed based on a large list of indicators, rather than relying on one -GDP per capita-. From the United Nations conference "Paris Biosphere Conference" of 1968, many official agencies focused on the development of comprehensive systems for monitoring progress with economic, social, and environmental indicators. Despite its impact, the main limitation of the Social Indicators Movement lies in the absence of a theoretical foundation, which was provided by the capability approach (Sessa, 2016).

In the eighties, Sen (1980) introduced the capability approach as a general approach to evaluating the human condition. This approach broke with traditional welfare economics (Gough et al., 2007; Robeyns, 2005). The capability approach is a broad normative framework for the evaluation and assessment of individual well-being or the average well-being of the members of a group and the design of policies (Robeyns, 2005). The capabilities approach focuses on the plural or multidimensional aspects of development and claims that income and resources do not provide a sufficient or satisfactory indicator of well-being as they measure means rather than ends. It is necessary to take into consideration what individuals can do not only with the technologies they have, but also, and most importantly, with their human capital, or using more precise wording, the capabilities they have (Nussbaum, 2011; Sen, 1980, 1992). The capability approach has also provided the theoretical foundations of the human development paradigm (Fukuda-Parr & Kumar, 2004). Since 1990, the United Nations Development Programme has calculated the Human Development Index at the country level on an annual basis. However, in the sphere of political decision-makers, macroeconomic indicators continued to be the most used to measure economic and social progress and to define their policies.

Recent decades have witnessed growing demands from both academic and political sectors, as well as the public, to develop better approaches to measure and monitor QoL more comprehensively. The main argument is that a single economic measure does not account for the social cost of economic development, such as the cost of urbanization or pollution, among others; and nor does it take into account income distribution or significant assets, such as educational

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[1]Following Michalos et al. (2011) and Veenhoven (2017), in this chapter we use interchangeably the terms "well-being" and "quality of life", because both terms must be interpreted in the broad sense of living a good life.

opportunities, employment opportunities, personal safety, and political freedoms (Neumayer, 2003; Nussbaum, 2011; OECD, 2017; Stiglitz et al., 2011; Van den Bergh, 2009). Neither it considers the subjective aspects influencing QoL (Diener, 2002; Frey & Sutzer, 2002). The inclusion of self-reported indicators is crucial to properly measure QoL since they are related to the nonmaterial aspects of human well-being, such as the influence of social relations, trust in people, autonomy, and self-determination (Bárcena-Martín et al., 2017; Bartolini & Sarracino, 2014; Dolan & Metcalfe, 2012; Frey & Stutzer, 2002; Stutzer & Frey, 2010). In practice, this new approach is now being considered, with several international initiatives stressing the importance of including data on self-reported well-being, as well as objective well-being in larger-scale surveys undertaken by official statistical offices because all of them contribute to measuring QoL (see, for instance, Eurofound, 2017; OECD, 2017; Stiglitz et al., 2011).

3. Social indicators and databases to study the quality of life in Europe

In the European Union, as well as worldwide, social survey methods are the most common tool for collecting the variables needed for measuring both objective and subjective indicators on QoL. In such surveys, QoL is often measured by asking respondents to report or evaluate various aspects of their lives split into QoL domains.

At least four sample surveys can be used for monitoring QoL in Europe. They are the Eurobarometer Survey, the European Values Study (EVS), the European Social Survey (ESS), and the European Quality of Life Survey (EQLS). Table 1 summarizes the main characteristics of these surveys. The aim is an assessment of what their database offers for studying QoL. Furthermore, more recently (2013 and 2018), Eurostat launched two ad-hoc modules of the European Union Statistics on Income and Living Conditions (EU-SILC) survey on material deprivation, well-being, and housing difficulties. These ad-hoc modules complement the variables permanently collected in EU-SILC with supplementary variables highlighting the above-mentioned domains of QoL. Therefore, also EU-SILC database in these two years can also be considered another useful source of information for studying QoL at the European level.

In this section, we focus on EQLS because this survey has some characteristics and advantages compared to other databases that better suit our conceptual approach to QoL. In particular, the European Foundation for the Improvement of Living and Working Conditions (Eurofound) contributes to monitoring QoL in Europe through the EQLS, which consists of nationally representative surveys conducted in several European countries as shown in Table 1. It is a unique European survey that examines both the objective circumstances of European citizens' lives and how they feel about those circumstances and their lives in general. EQLS has also developed a valuable set of indicators related to environmental and social aspects of progress which complements traditional indicators of economic growth and living standards such as GDP or income, and they are easily integrated into the decision-making process and taken up by public debate at EU and national levels in the EU. Following Eurofound (2012, 2017, 2019), as shown in Table 2, QoL can be measured through a set of social indicators arranged in different domains. They are: subjective well-being, living standards and deprivation, housing conditions or quality, health and mental well-being, employment and work-life balance, family and social life (quality of relations), social exclusion and community involvement, local environment, public services, trust in people and institutions and access to services Moreover, what is more relevant is that some questions from the second EQLS were asked as part of the Eurobarometer Survey in 2009 which allowed the study of trends in QoL in the EU from 2003 to 2009.

To sum up, the conceptual background for the EQLS (Eurofound, 2003) is based on the following three pillars: i) a multidimensional approach, ii) incorporating individual and societal perspectives, and iii) combining objective and subjective indicators.

Table 1. Main characteristics of sample surveys for studying QoL in Europe

Survey	Started	Periodicity	Sample design	Countries (last wave)	Domains of QoL
Eurobarometer	1973	Bi-annual	Repeated cross-section	European Union member countries	General life satisfaction Living conditions Social security Environment Technology Health Family issues Social exclusion
European Values Study (EVS)	1981	Every 9 years	Cross-national and longitudinal	47 European countries/regions	Family Work Environment Perceptions of life, politics, and society, Religion and morality National identity
European Social Survey (ESS)	2002	Every 2 years	Cross-sectional	19 European countries[a]	Media and social trust Politics Subjective well-being Household Human values Others[b]
European Quality of Life Survey (EQLS)	2003	Every 4 years	Cross-sectional	34 countries (27 EU members, and Croazia, Islanda, Ex RepubblicaYugoslav di Macedonia, Montenegro, Serbia, Turchia, and Kosovo)	Employment Income Education Housing Family Health Work-life balance Happiness Life satisfaction Self-reported quality of their societies

Note. [a] Not all the participating countries are the same every round. [b] There are other topics such as health and care, welfare attitudes, and work-life balance, among others, but they are only available in one or two rounds.

Table 2. Indicators of quality of life based on EQLS

Quality of life	
Subjective well-being	Life satisfaction Happiness Optimism about one's future Optimism about one's children's or grandchildren's future
Living standards	Satisfaction with living standards Difficulty making ends meet Material deprivation Economising on food
Housing conditions	Leaks, damp, or rot in accommodation Lack of both bath/shower and toilet Ability to pay to keep the home warm
Health and mental well-being	Self-rated health WHO Mental Well-being Index Risk of depression Participation in sports or physical exercise
Work–life balance	Energy to do household jobs Difficulty fulfilling family responsibilities because of work Difficulty concentrating at work because of family issues Working hours do not fitting personal commitments
Quality of public services	
Public services quality ratings	Health services Education system Public transport Childcare services Long-term care services Social housing State pension system
Quality of society	
Social insecurities	Job insecurity Accommodation insecurity Insecurity around income in old age
Trust and tensions	Perceived tension between different racial or ethnic groups Perceived tension between poor people and rich people Feeling safe alone outdoors after dark Trust in people Trust in government Trust in local authorities
Participation and exclusion	Perceived social exclusion Involvement in civic and political activities Participation in voluntary work Participation in training

Note. Adapted from Eurofound (2019).

EQLS is also likely to be the most widely used survey by different researchers to monitor the level and the evolution of QoL in Europe following a multidimensional approach. In the last years, empirical evidence has been characterized by studies aiming to measure the impact of the worldwide economic crisis on QoL. We present below only some of the most relevant findings based on EQLS data.

Eurofound (2012) explored by descriptive and correlation methods eight domains of QoL considering the 2012 database. The results of this report highlighted that the financial and economic crisis deteriorated different aspects of QoL, such as living and working conditions, with negative impacts on the everyday lives of several European citizens. In addition, this report showed that there is a clear division between the Nordic and Western European countries and the Southern and Eastern European countries, with people in the former countries experiencing QoL as higher as compared to people in the latter countries. Similar results were also found by Betti et al. (2020). We discuss this paper in detail in the next section.

Somariba and Zarsosa (2019) constructed a synthetic indicator of QoL using DP2 methodology through eight different dimensions with data from 2012 EQLS. They also found a certain spatial pattern where Nordic countries together with those located in central Europe present better QoL than Eastern European countries. Specifically, their evidence showed that Bulgaria is the worst European country in terms of QoL, whereas Denmark is the best. Analogous results were also found in Betti (2016, 2017), who worked with a fuzzy set theory with 2012 and 2007-2012 EQLS data, respectively. Moreover, it is worth noting that a similar conclusion was also reported by Rogge and Van Nijverseel (2019), despite they worked with a different dataset (EU-SILC).

Sandor et al. (2013) examined the QoL of different types of families with children in the context of the economic crisis. The results are based on the 2007 and 2012 databases. In their report, simple statistical tools such as chi-square statistic and t-test were used to identify statistically significant differences between categories or average values between different types of European families or different country groups. Eurofound (2017) used more than eight domains of QoL, 2011 and 2016 databases and descriptive methods. Findings showed that the QoL of those European citizens in the lowest income quartile has improved less than for others, and, in general, the EU has experienced a return on some dimensions, such as overall health, standard of living or the work-life balance, top re-crisis levels.

Kristapsone and Bruna (2019), using eight domains of QoL from the 2012 and 2016 EQLS database and descriptive and inferential statistical analysis, analyzed changes in QoL between both years. They found that, after the economic crisis, in the EU only the indicator related to satisfaction with the present state of the economy in the country increased between 2012 and 2016, whereas the other seven indicators of QoL retained the same assessment level in both years, so the satisfaction with the other domains did not change between this period. They also concluded that EQLS data shows that the economic growth, social and economic reforms, and social security efficiency in the surveyed period of post-crisis in the EU have not significantly contributed to their assessment of quality of life.

4. A fuzzy and multidimensional approach for studying quality of life

As we discussed previously, the empirical findings on QoL are characterized by a plurality of approaches because the concept itself varies widely and is complex due to its multifaceted nature that is not easy to define and measure (Glatzer, 2006; Mauro et al., 2018). Thus, we concentrate our attention on a specific methodological approach that can be used in this framework, namely the fuzzy and multidimensional approach introduced by Betti et al. (2016) for studying the QoL in Macedonia. This approach was later applied by Betti (2017) and Betti et al. (2020) using a more appropriate statistical approach for measuring the effect of economic crisis in QoL in Europe with

EQLS data. Table 3 summarizes the eight domains of QoL, and the single 48 social indicators articulated by Betti (2016, 2017) which, in turn, are based on the seminal contributions of Nussbaum and Sen (1993), Phillips (2006) and Eurofound (2003,2010), summarized above in Table 2.

Table 3. Domains and single social indicators of quality of life

QoL1 **quality of relations**	q25a	Poor and rich people
	q25b	Management and workers
	q25c	Men and women
	q25d	Old people and young people
	q25e	Different racial and ethnic groups
	q25f	Different religious groups
QoL2 **trust in people and institutions**	q28a	The parliament
	q28b	The legal system
	q28c	The press
	q28d	The police
	q28e	The government
	q24	Would you say that most people can be trusted, or that you can't be too careful in dealing with people?
QoL3 **access to services**	q47a	Distance to doctor's office/hospital/medical center
	q47b	Delay in getting an appointment
	q47c	Waiting time to see a doctor on the day of the appointment
	q47d	Cost of seeing the doctor
QoL4 **quality of public services**	q53a	Health services
	q53b	Education system
	q53c	Public transport
	q53d	Childcare services
	q53g	State pension system
QoL5 **subjective well-being**	q40a	Your education
	q40c	Your present standard of living
	q40d	Your accommodation
	q40e	Your family life
	q40g	Your social life
	q29e	I feel left out of society
	q30	Life satisfaction
	q41	Happiness
QoL6 **Housing quality**	q59a	Keeping your home adequately warm
	q19b	Rot in windows, doors or floors
	q19c	Damp or leaks in walls or roof
	q19d	Lack of indoor flushing toilet
	q19e	Lack of bath or shower
	q19f	Lack of place to sit outside (e.g. garden, balcony, terrace)
QoL7 **standard of living**	q19a	Shortage of space
	q59b	Paying for a week's annual holiday away from home
	q59c	Replacing any worn-out furniture
	q59d	A meal with meat, chicken, and fish every second day if you wanted it
	q59e	Buying new, rather than second-hand, clothes
	q59f	Having friends or family for a drink or meal at least once a month
	q60a	Rent or mortgage payments for accommodation
	q60b	Utility bills, such as electricity, water, gas
	inc_in	Income deciles
QoL8 **health**	q40f	Could you please tell me on a scale of 1 to 10 how satisfied you are with your
	q42_i	In general, would you say your health is ...
	q43_4	Chronic physical or mental health problems, illness, or disability
	q29a_	I am optimistic about the future.

Note. Adapted from Betti et al. (2020).

This methodology is based on two main hypotheses: i) the theoretical concept of QoL is not directly observable; rather, it is latent, and observed social indicators can be used as partial/imperfect measures of this underlying theoretical concept; ii) QoL is also a vague concept with different shades and degrees rather than an attribute that is simply present or absent for individuals in a society. The first hypothesis counts this approach in a formative measurement model as well as DEA-BoD, Distance P2, and MPI (Jimenez-Fernandez & Ruiz-Martos, 2020). The second hypothesis is, indeed, a new feature in a formative measurement approach.

The empirical application of such an approach is, obviously, strictly related to the availability of a set of social indicators that must be arranged in several QoL domains. However, the selection of meaningful and useful social indicators for the analysis is a non-trivial task. It is strictly dependent on the conceptual framework (Maggino, 2017) of the phenomenon to study and limited by the data availability (see, for instance, Guio & Marlier, 2017, in the framework of poverty analysis). Nevertheless, EQLS data offer a great opportunity for the empirical implementation of such an approach because this survey collected several social indicators that can be arranged in different domains. We briefly introduce the main steps that characterize the multidimensional and fuzzy approach.

Generally, each social indicator being measured on an ordinal scale of 1 to a maximum (for example in EQLS data is generally 10) needs to be converted into the interval [0,1] according to the fuzzy logic. The transformation used can be found in Betti et al. (2015) and Betti et al. (2020).

Let I_k be the *k-th* social indicator converted into the interval [0,1]. Explorative and confirmative factor analysis is typically used to group these indicators into dimensions that represent specific aspects of QoL. Each dimension *s*can is composed of a different number of single indicators I_k (k = 1, ..., K_s) based on the results of factor analysis. For instance, in Betti et al. (2020) eight different dimensions were individualized (see Table 3). Associated with each dimension *s* is then computed a function, named membership function, that is a quantitative specification of the individual degrees of quality of life. Accordingly, a membership function's value is 0 for the lowest level of quality of life and 1 for the highest level. Let $QoL_{(s)j}$ indicates the membership function of *sth* dimension for the *jth* individual (*j=1...n*) in the sample. Therefore, as values increase from 0 to 1, the well-being of the *jth* individual for the corresponding dimension increases. $QoL_{(s)j}$ is computed as:

$$QoL^t_{(s)j} = \sum_k w_{(s)k} I^t_{(s)kj} / \sum_k w_{(s)k} \tag{1}$$

where $w_{(s)k}$ is the weight of I_k in the *sth* dimension. In turn, $w_{(s)k}$ is computed as the product of two components that consider both the dispersion of the indicator I_k in the *sth* dimension and its correlation with the other indicators in the same dimension *s*.

Finally, a comprehensive measure of the QoL of each individual *j* can be obtained as the weighted mean over the *S* dimensions of the dimension-specific $QoL_{(s)j}$:

$$QoL_j = \frac{\sum_s QoL_{(s)j}}{S} \tag{2}$$

The outcome of this procedure allows obtaining very simple synthesis measures. Indeed, the (sample) weighted means ($\overline{QoL}_{(s)}$, s = 1,...,S and $\overline{QoL}$) of equations (1) and (2) give the measures of the degree of quality of life observed in each dimension *s* and for all dimensions as a whole, respectively.

Following this approach, Betti et al. (2020) found that the negative effect of the crisis on QoL was very high, especially in Greece, Malta, Ireland, Cyprus, the Czech Republic, and Poland. However, they found the opposite result in Macedonia. Moreover, they pointed out the heterogeneous impacts of the economic crisis on the QoL of European countries concerning both countries and the type of dimension observed. Indeed, some dimensions seem significantly decreased for many

countries, while for others, the variations have been positive, albeit to a smaller extent. Specifically, they concluded that the economic crisis has harmed the overall standard of living, on the trust in institutions, and some aspects of the health situation, whereas it has led individuals to increase connections with friends and mainly relatives to receive some kind of help and support.

5. Conclusions

In this chapter, we discussed the utility of applying a multidimensional and fuzzy approach for measuring QoL. This approach implies measuring QoL using a formative measurement model framework. In other words, we treat QoL as a multidimensional latent concept that can be explained by objective and subjective social indicators arranged in different domains of QoL. Moreover, the fuzzy measure also preserves the richness of the latent concept under study, because QoL is not only a difficult but also a vague concept to define. The value of the approach proposed in this Chapter can be summarized by considering at least three very interesting features, as discussed in Betti et al. (2020).

First, the latent dimensions of QoL are not predefined *a priori;* instead, they are identified by EFA and then validated by CFA. Second, the aggregation of social indicators into a domain is performed by a statistical-based weighting system. Namely, this weighting system considers measurement errors, redundancies, and other characteristics of the social indicators involved in following a "prevalence-correlation" (i.e., considering both the dispersion of a social indicator -prevalence weights- and its correlation with the other social indicators in each domain -correlation weights-). Third, the approach has the advantage of computing a composite indicator of QoL, simultaneously maintaining the multidimensionality of the phenomenon under study using different composite indicators in each domain.

However, it is important to stress that as with other formative measurement models, this methodology always involves stages where judgment must be made, for example concerning the selection of the social indicators and the weighting system. Indeed, the notion of measuring QoL could include, for instance, the measurement of practically anything of interest to anybody, and everybody could find arguments supporting the selection of a partially different set of social indicators. Therefore, the empirical analysis must be conducted following transparent steps to achieve comprehensible and meaningful results.

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