ORIGINAL RESEARCH

The Effect of Social Cohesion on Subjective Individual Quality of Life in European Countries

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Abstract

Many scholars have studied the effects of economic conditions on subjective well-being, but scarce attention has been paid to the effect of cultural and social determinants on quality of life. This study aims to analyse the effect of social cohesion considered as a characteristic of a country on subjective quality of life. In addition, we also tested the moderating effect of social cohesion on the relationship between income and placement in society with quality of life. To test our hypotheses we estimated a multilevel regression model. First, we estimated the null model, which showed that almost a quarter of the variance in quality of life is located at country level. Second, we included in the model all the level-1 predictors. This model highlighted that self-evaluated position on the social ladder has a larger positive effect than income on quality of life. In the third step, we added country-level predictors. Controlling for other macro factors—GDP, Life Expectancy, Gini coefficient and Homicide rate—and individual-level variables, we shows that Cohesion exerts a positive effect on subjective quality of life. The model also points out that country's economic conditions (measured by GDP) do not affect quality of life when we control this relationship for social cohesion. Interestingly, also the within-country economic disparities (measured by Gini coefficient) do not seem to affect quality of life when cohesion is taken into account. Finally, we also shows that the positive effect of income on quality of life is moderated by cohesion. In other words, income is a relatively less important factor in determining quality of life in countries with higher levels of cohesion. In the same way, individuals' position and perception of their placement on the social ladder affects in a lesser extent their quality of life in those countries that have higher degrees of cohesion.

Keywords Social cohesion · Quality of life · Multilevel model · European Social Survey

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1 Introduction

Many scholars have speculated about what might make people happy. Socrates, for example, believed that happiness was the result of inner virtuous behaviour. Aristotle, on the other hand, saw happiness as the result of an inner sense that recognises the "golden mean" (aura mediocritas) between two extremes (Diener & Suh, 1997). Thus, the question of happiness has attracted the interest of many different disciplines. In psychology, for example, the field of positive psychology aims to study human strengths and well-being. (Seligman & Csikszentmihalyi, 2000).

The more recent theoretical and philosophical reflections focused also on human needs. According to the Marxist school of thought (e.g. Heller, 1976; Marcuse, 1964), capitalist societies have produced alienation and dependence on a range of unnecessary goods that aim to distract people from their true needs. The theoretical considerations concerning the needs have also been a fundamental theme for other researchers. Maslow (1943), for example, distinguished between basic needs and secondary needs, while Inglehart (1977) noted a generational shift in values from materialistic to post materialistic. Of particular importance in this framework is the fact that the concept of well-being is moving away from the idea of possessing goods and is associated with concepts such as happiness, free self-expression, and conformity of lifestyle to the individual's moral and ethical values.

Historically, economists have associated well-being with the acquisition of material resources (Stiglitz et al., 2009). Thus, GDP became the primary statistic for evaluating countries' well-being and their policies. However, this approach seems to be quite limited nowadays (Costanza et al., 2009; Diener & Seligman, 2004; Diener & Suh, 1997; Stiglitz et al., 2009). The gap between economic progress and well-being has never been as large as it is now. Climate change, refugees, terrorism, sustainability, and renewable energy are amongst the emerging political and social issues facing most industrialised countries. The realisation that simple economic expansion is not a viable alternative to deal with the new difficulties of modernity is spreading worldwide (Noll & Zapf, 1994). There is also the prevalent opinion that these new social and political challenges could threaten the cohesion of Western countries.

As a result of these concerns, it became clear that other attributes must be examined to determine well-being (Stiglitz et al., 2009). There are three reasons for this. First, economic growth could be negatively related to critical components of well-being such as leisure time, environmental quality, and income inequality. Second, different people have different capabilities to transform resources into well-being (Nussbaum, 2011; Sen, 1985). Resource availability is not a sufficient criterion to assess individual well-being. Moreover, some scholars (Campbell, 1981, Diener et al., 1995) show that different individuals may perceive the same life conditions differently depending on their personalities. Individual experiences and their interpretation are the key components of this approach rather than "external conditions" (Campbell et al., 1976). The third aspect is that the relationship between objective circumstances and subjective well-being may be nonlinear. This means that there are no clear thresholds of poverty or wealth beyond which people's happiness levels change dramatically. Rather, the relationship is often curvilinear: happiness increases up to a certain income level before stabilizing or declining (Kahneman & Deaton, 2010).

Amongst the attributes that must be examined to determine well-being—besides economic ones—(Stiglitz et al., 2009), an attribute that received increased attention, especially from Institutions (e.g. EU, OECD), is social cohesion. In its report, the OECD states that social cohesion contributes to maintaining a long-term economic growth (OECD, 2011).

This is because the economic growth within a country where social exclusion is wide-spread is unlikely to be sustainable. Social cohesion, which is linked to higher level of interpersonal trust, trust in institutions and legitimacy of the government bodies, translates also into more effective policies like for example those aimed at addressing inequalities or improve social mobility. Therefore, the link between social cohesion and quality of life seems to be evident. If in a country there are marginalised groups, they will contribute less to the general well-being. These people will be less educated and have limited skills and therefore their contribution will be limited. Moreover, they may also exhibit reduced willingness to contribute, as they feel society does not treat them as full citizens (OECD, 2011).

In our study, we will examine the effects of social cohesion on quality of life. In particular, we will focus on the impact of social cohesion, considered as a macro-level variable, on individual quality of life. To assess the relationship between cohesion and quality of life, we estimated a multilevel model, controlling the relationship for several other individual and country-level predictors, and measured the main effect of social cohesion and its interaction with other individual-level variables.

Despite the large amount of research on social cohesion, there remains considerable confusion regarding its definition, which are its constituting factors, antecedents or consequences, and the appropriate level at which to measure it. In addition, studies on social cohesion that use an empirically tested and validated definition of cohesion are limited, focusing on providing theoretical definitions of cohesion. In this paper, we employ an empirically tested and cross-culturally validated definition of social cohesion, which has been corrected for measurement error and measured at country level.[1] Furthermore, we use a theoretically-driven composite variable for quality of life that considers the multidimensional nature of the concept. To the best of our knowledge, there is still little research (an exception is for example Delhey & Dragolov, 2016) that analyses the relationships between cohesion and quality of life in a comprehensive way, and not just sub-dimensions of those two concepts.

In the next section, we will briefly review studies on quality of life and cohesion to provide a theoretical background. We then move on to evaluate the aggregate effect exerted by cohesion on subjective quality of life, controlling—at aggregate level—for gross domestic product per capita, life expectancy, economic inequality, and homicide rate. At individual-level we will estimate the effects of several predictors (in particular, household income and placement in society) on subjective quality of life, also assessing their interactions with social cohesion. The analyses have been carried out using the European Social Survey dataset (Round 6), which comprises more than 50,000 individuals and 29 countries in Europe.

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[1] The model of social cohesion is derived from Bottoni's proposition (2018a). The author employed a multilevel structural equation model to build a composite variable of social cohesion that showed measurement invariance across the countries analysed.

2 Conceptual Framework

2.1 Quality of Life and Social Cohesion

Because of its broad applicability in many settings by academics in order to address different research objectives, the concept of quality of life (QOL) poses significant challenges to researchers (Phillips, 2006; Sirgy et al., 2006). There is minimal agreement on the concept of QOL. There are three broad methods to conceptualise QOL (Diener & Suh, 1997). The first involves describing the elements of an adequate quality of life as prescribed by normative, religious, and philosophical values. The second approach assumes that individuals choose things that improve their quality of life, and that quality of life is essentially the difference between what they have and what they seek. Finally, the last method relates quality of life to individual experiences. Pleasure, happiness, life satisfaction, and contentment are all important to this approach. This is the perspective most closely related to research on subjective well-being. In our study, we used the third strategy. Indeed, the debate surrounding social progress has stressed the necessity to move beyond solely economic and objective measures of quality of life, emphasising the growing importance of incorporating subjective measures (Stiglitz et al., 2009).

In general, subjective QOL refers to the overall well-being in individuals' life or, more specifically, to numerous areas of life that make life joyful and valuable (Veenhoven, 2013). However, in other cases, QOL may also refer to the overall quality of a society and therefore it is considered as an attribute of an aggregate (usually a country). Noll (2002) provides an in-depth examination of the concepts of quality of life as they apply to society. In addition to the dichotomy between QOL as an individual attribute and QOL as an aggregate attribute, two other historically divergent ideas can be found in the literature. The Scandinavian approach (Erikson, 1993) focuses on resources and objective life circumstances, whereas the American approach (Campbell et al., 1976) attempts to analyse the subjective conditions of the individual.

The fact that quality of life is an umbrella term is also emphasised by Veenhoven (2012, 2013). Based on four dimensions—namely the distinction between opportunities and outcomes and the difference between external and internal qualities of life—Veenhoven (2000, 2012) developed a fourfold typology that identifies four different concepts of quality of life. The four concepts refer to "Livability of environment", "Life ability of the person", "Utility of life" and "Satisfaction with life". For our purposes, we are primarily interested in the first and last concepts. Livability refers to the specific characteristics of a context in terms of the quality of the environment (e.g., housing quality, pollution, traffic congestion). Thus, these characteristics refer to the quality of an aggregate as a whole rather than to individuals (Veenhoven, 1996). The quality of life of an environment is a prerequisite for subjective well-being; consequently, livability is a factor that determines individual quality of life. In the model described in the next section, we considered social cohesion as a measure of livability. Instead, "satisfaction with life" refers to life's outcomes and depends on individuals' subjective opinions. People base their assessments on two sources of information. The first source refers to emotional appraisals, which we measured as happiness, and the second refers to cognitively directed appraisals, which we measured as satisfaction in our model.

In our conceptual framework, the idea of capability (Sen, 1993) or "life ability of the person" (Veenhoven, 2000, 2012) is equally significant. This refers to how well and to what extent people are equipped to face life's challenges. Amongst the other aspects, in our model we have considered placement in society and economic conditions as a crucial part

of the people's equipment. Since the Easterlin paradox revealed several contradictory findings, research on the relationship between economic conditions and well-being has multiplied (see Easterlin, 2001). The most widely accepted observation is that happiness is often lower in poorer countries and tends to grow more slowly as GDP increases (Veenhoven, 1991; Diener et al., 1993; Diener & Diener, 1995; Frey & Stutzer, 2002; Diener & Biswas-Diener, 2002; Hagerty & Veenhoven, 2003). However, these results are not consistent. According to time series studies, economic development does not increase subjective well-being (Easterlin et al., 2010). These results suggest that other factors besides economic growth influence well-being.

Many scholars have studied the effects of economic conditions on subjective well-being, but scarce attention has been paid to the cultural and social determinants of QOL. One of the characteristics that could explain differences in individual quality of life is social cohesion.

According to Vygotsky (1978), human action takes place in a social and cultural environment. Consequently, any study of human behaviours and attitudes should consider and evaluate the social and cultural context. In this study, social cohesion is considered exclusively as an attribute of an aggregate (e.g., a country, region, group, etc.). Cohesion cannot be referred to as an individual attribute because it is illogical to attribute cohesion to only one person (Janmaat, 2011).

Although the concept of social cohesion dates back to Durkheim's, 1893 research, there is no unified conceptualisation in the academic literature (Friedkin, 2004; Janmaat, 2011). Two parallel methodologies can be identified in the study of social cohesion. The first is an academic method established in sociology and social psychology, while the second is an institutional approach developed primarily by policymakers (Addeo et al., 2017; Chan et al., 2006).

Both have their own limitations. The policy-oriented approach linked cohesion to the various particular difficulties faced by governments at the time, resulting in a problem-oriented approach that confused causes and consequences (Chan et al., 2006). Instead, sociologists and social psychologists have been unable to produce a unified and consistent conceptualization of social cohesion, which has prevented the development of a well-structured and shared theory of social cohesion (Friedkin, 2004).

Jenson (1998) has created one of the best-known conceptual frameworks for social cohesion. The author outlines five basic aspects of cohesion that address issues such as shared ideals, equality, participation, respect, and tolerance. Instead, Berger-Schmitt (2002) sees social cohesion as a tool to achieve two goals: reducing inequality and improving social interaction.

Chan et al. (2006) proposed a scheme consisting of two dimensions—horizontal cohesion (between individuals) and vertical cohesion (between the state and citizens)—and a subjective and objective view. Others focused on more theoretical aspects. Lockwood (1999) sees cohesion as the opposite of social disintegration. Cohesion and civic integration, results in the overarching concept of social integration. Janmaat (2011), on the other hand, attempted to test the existence of a "universalist" and "particularist" perspective by identifying the following dimensions: solidarity (social trust), equality, consensus on fundamental values, and participation (civic participation, tolerance, national pride, and lack of institutional trust).

According to Janmaat (2011), contemporary scholars have interpreted the term only ideally and in a utopian way. While various attempts have been made to provide definitions of cohesion, little attention has been paid to provide an empirically validated conceptualisation of social cohesion that uses the right approach to deal with the nature of the

concept. As far as we know, the studies conducted by Dickes and Valentova (2013), Dickes et al. (2010) and Bottoni (2018a, b) are notable exceptions. Dickes and Valentova (2013) pointed out that the conceptualisation offered by Chan et al. (2006) is consistent with Bernard's (1999) theory of social cohesion and have provided a definition of social cohesion based on the integration of the two contributions. They used confirmatory factor analysis to validate the proposed multidimensional measure of social cohesion and pinpointed four factors: institutional trust, solidarity, sociocultural engagement, and political participation. They also demonstrated that the proposed model is the same across all the nations studied (European Values Study 1999), allowing the calculation of comparable national scores for social cohesion. Similarly, Bottoni (2018a) presented a multilevel measurement model of social cohesion based on data from the European Social Survey. The validity of the model was assessed using a multilevel confirmatory factor analysis method that took into account not only multidimensionality but also the multilevel structure of cohesion.

The author identified the presence of a generic second-order factor—social cohesion—, as well as seven first-order constructs—interpersonal trust, density of social relations, social support, openness, participation, institutional trust, and institutional legitimacy. Bottoni (2018a) demonstrated that the proposed model of social cohesion is invariant across the 29 countries studied, suggesting that the processes underlying social cohesion are consistent across European countries.

The positive impact of social cohesion on quality of life has been made evident by several empirical results. Social cohesion has been proved to have positive effects for wealth and economy in general (Narayan-Parker & Pritchett, 1997). McCracken (1998) lists several factor that are affected by social cohesion. These include: lower social costs, better performances of institutions, increased innovation, higher investment ratio, and reduced transaction costs. Cohesion was showed to have an impact not only on economic aspects of quality of life but also on other aspects like education, health and crime rates (Coleman, 1988; Putnam, 2001; Williams et al., 2020). Besides the research showing the effect of cohesion on country level variables (e.g. crime rate), several studies highlighted also the effect of social cohesion on individual-level, subjective measures. People living in those countries where social cohesion is higher have been found to be more satisfied, happier and have an higher psychological well-being (Ballas et al., 2016; Delhey & Dragolov, 2016; Paramita et al., 2021). Controlling for living arrangement (i.e. living alone vs. living with family), Burnette et al. (2021) showed that social cohesion has a positive effect on quality of life of older adults in China. Cohesion has been also found to promote resilience amongst survivors of natural disasters. Shigemoto and Kawachi (2020) showed that social cohesion had a positive effect on psychosocial quality of life after 15 months from a natural disaster (the effect was not statistically significant after 6 months).

Regardless the large amount of research available on quality of life, there is still confusion on the concept of social cohesion and how it should be measured (e.g. attributing social cohesion scores to single individuals). Also, the concept of social cohesion and quality of life are so interconnected that this has generated some confusion, resulting in the partial overlap of the two concepts (Berger-Schmitt, 2002). Concerning this aspect, for example the Council of Europe consider social cohesion as the society's ability to secure the long-term well-being of all its members (Council of Europe, 2005).

In this paper we use an empirically-tested definition of social cohesion measured at the proper level, that is countries (corrected also for measurement error), that does not mix up constituting factors, antecedents and consequences of social cohesion to assess the effect of this factor on quality of life. We predict that social cohesion has a positive effect on individuals' quality of life. Higher levels of social cohesion, which means

higher levels of interpersonal trust, institutional trust, participation, contribute to create a positive sense of belonging, reduce feelings of being excluded, and people are more willing to contribute and create networks. This in turn affects their well-being and general quality of life.

The next sections examine the effect of social cohesion—considered as a macro phenomenon—on individual quality of life.

3 Methodology

3.1 Objectives and Hypotheses

The study aims to analyse the macro-level effect of social cohesion considered as a characteristic of a country on subjective quality of life. In order to avoid spurious relationships, especially with reference to the "modernity syndrome" (Veenhoven, 2012), we controlled the relationships for other fundamental country-level properties. First of all, we controlled the relationship for GDP per capita at current prices and Gini coefficient evaluating if the absolute and relative—in terms of disparities—economic conditions have a higher impact on individual well-being than social conditions. In addition, we added to the model other two dimensions regarding normalised intentional homicide rate and life expectancy as proxies of high livability of the environment. We employed a multilevel modelling approach since this method is the most appropriate to treat macro-level predictors providing estimates and standard errors based on level-2 units rather than on level-1 units.

As said, social cohesion is anticipated to be linked to an improved quality of life by fostering strong bonds within communities and societies. These connections help cultivate a feeling of belonging, which in turn enhances people's overall well-being. Thus, our first hypothesis is:

H1 Living in a country with higher degrees of social cohesion improves subjective quality of life. Consequently, social cohesion exerts an aggregate positive effect on individuals' quality of life.

Even though the findings about the effect of material well-being on subjective well-being are not consistent, it is generally accepted that income exerts a weak positive effect on subjective quality of life (Diener & Biswas-Diener, 2002; Frey & Stutzer, 2002; Layard, 2005; Veenhoven, 2012). Besides income, there is another mechanism that can affect individuals' quality of life. People generally tend also to assess their condition by comparing it to other individuals' situation. For these reasons in the model we introduced two variables regarding respectively the available total net household income (measured in deciles) and the perception of the placement in society where people place themselves. In our study, we are also interested in evaluating the effect that cohesion can have in moderating the relationships between those two variables and subjective quality of life. Indeed, cohesion can have a moderating effect on income variable as it contributes to produce and foster equality in a society. In the same way, concerning placement in society, cohesion can work as moderator as it promotes fairness within a society, fostering social mobility and transforming principles of fairness into reality. Therefore, two further hypotheses can be written as:

H2 Social cohesion moderates the positive effect of income on subjective quality of life. Therefore, income is less important in predicting quality of life in countries with higher levels of social cohesion.

H3 Social cohesion moderates the positive effect of high placement in society on subjective quality of life. Precisely, being on top of the social scale in highly cohesive countries have a smaller effect on quality of life.

3.2 Data

All the analyses are based on the European Social Survey (ESS) Round 6 (2012–2013). ESS is an academically driven biennial cross-national survey conducted since 2002. Methodologically speaking, ESS represents a valuable source since it is focused on the standardisation of procedures and methods across participating countries, permitting genuine comparisons between European countries. The standardised procedures concern sampling, data collection, translation, preparation and delivery of the data. Quota sampling and substitutions (whether refusals, non-contacts or ineligibles) are not allowed at any stage and individuals are selected by strict random probability methods. ESS round 6 comprises more than 54,000 individuals nested in 29 countries (see Appendix Table 2 for sample size within each country). In the Table 3 (in the Appendix), we report the unweighted distributions of the variables used in the models. Before performing the analyses, data have been weighted to reduce non-response bias. Post-stratification weights[2] have been applied as highly recommended by European Social Survey weighting guide.

3.3 Variables and Method

Our main independent variable—social cohesion—is derived from Bottoni's proposition (2018a). The author specified a multilevel measurement model identifying a level-2 s-order general factor, namely social cohesion, accounting for all the seven level-2 first-order latent constructs of social cohesion. We selected Bottoni's study because the social cohesion multilevel model has many interesting characteristics for our purposes. Indeed, the model showed isomorphism between level-1 and level-2 latent constructs, and, more importantly, it showed measurement invariance; that is, the same social cohesion model held across European countries.[3] In cross-cultural studies, measurement invariance is a fundamental topic since it represents a necessary condition in order to compare groups on latent constructs and the lack of it can cause several issues in comparative research (e.g. translation and cultural biases). Thus, we reran the same model presented in Bottoni (2018a)—employing maximum likelihood estimation—and saved the standardised latent factor scores regarding the social cohesion construct.[4] Our study is one of the few

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[2] Post-stratification weights are a weighting strategy that employs auxiliary information to reduce the sampling error and non-response bias.

[3] For more information about isomorphism see Adamopoulos (2008) and Fontaine (2008); for measurement invariance see Meredith (1993), Davidov et al. (2012, 2014) and Jak et al. (2013).

[4] We do not report here fit indices and other statistics as the model is exactly the same as the model presented in Bottoni 2018a. Reporting all the statistics would have required too much space and considering that building a model of social cohesion is not the aim of our paper we refer interested readers to Bottoni 2018a.

studies where the aggregate nature of cohesion is truly taken into account by means of a multilevel measurement model accounting for measurement error at the same time. The standardised latent scores of social cohesion resulting from Bottoni's model (2018a) constitute our main independent variable. More precisely, the social cohesion variable results from a multilevel measurement model composed of 24 indicators—theoretically selected from ESS Round 6. These 24 indicators (see Bottoni, 2018a), or observed variables, were used to measure seven sub-dimensions of social cohesion that refer to interpersonal trust, density of social relationships, social support, openness, participation, trust in institutions and legitimacy of the institutions. These latent variables in turn were used to identify a second-order factor; that is, social cohesion.

Other level-2 variables concerning country-level properties have also been included in the model (see Table 3 in Appendix for summary statistics). Precisely, at country-level we considered the GDP per capita, Gini coefficient, life-expectancy, and homicide rate. These variables (and also all the other continuous variables) have been added to the model centering their scores to the general mean in order to avoid collinearity when interaction terms are created and to avoid not plausible situations (e.g. ESS eligible respondents start from 15 years thus 0 is not a plausible value). At individual-level we added to the model 15 predictors/control variables (see Table 3 in Appendix for a comprehensive list and for descriptive statistics) drawn by ESS Round 6. Besides demographics (gender, age, education, rural–urban area), these variables refer to several dimensions like religiosity, employment conditions, income, social status, divorce, party affiliation.

Precisely, we included a variable measuring people religiosity as this dimension has been shown to positively impact on quality of life (Piedmont & Friedman 2012). We inserted in the model also household income measured in deciles. Poverty has repeatedly been proved to be correlated with low levels of well-being. However, this happens up to a certain level of wealth; after this level, further income increases make only small differences to quality of life (Diener & Tov, 2012).

Since the first studies on working conditions and unemployment (Jahoda et al., 1933) it has been highlighted the strongly negative impact that unemployment exerts on mental well-being. We added two variables to measure employment conditions: the type of employment contract—temporary/no contract or permanent—and employment status—being employed or unemployed.

Another variable added to the model is "Hampered in daily activities by illness/disability/infirmary/mental problem". This is different from the affective appraisal concerning the subjective perception of general health. This variable instead can be considered as a capability (Sen, 1993) or a property concerning, as defined by Veenhoven (2000), the "life ability" dimension.

Another variable added to the model is "Divorce" as research (Cummins et al., 2012; Sarason et al., 1990) showed the positive effect of being in a mutual and supportive relationship on well-being.

As a measure of social status we used the variable "place in society", which aims to measure the subjective perceived position within the society (respondents were asked to place themselves on a social scale going from 0—bottom of our society—to 10—top of our society). This variable helps us to test if the relative perceived position of an individual in comparison to others plays a bigger role than absolute income (see Easterlin et al., 2010). Other level-1 variables included in the model are: being part of a discriminated group, being part of a minority ethnic group, being victim of burglary/assault, and closeness to political parties.

In order to measure our dependent variable, we selected five indicators from ESS6. Thus, the subjective quality of life has been considered a function of five distinct elements. Instead of operationalising subjective quality of life employing just one measure (generally an item measuring life satisfaction or happiness on a 0–10 scale), we preferred to follow a multiple indicators approach. As Maggino and Zumbo pointed out (2012), adopting a single indicator approach can result in a wide and not negligible amount of error involving reliability and validity. The indicators selected to measure individual quality of life refer to satisfaction, happiness, subjective general health, subjective assessment of financial situation and feeling of safety (see Table 4 in Appendix for summary statistics of the indicators of subjective quality of life). The issues about the quality of the measurements have been extensively examined in past research (Diener, 1984; Veenhoven, 1993). The conclusion of this research is that subjective indicators, even though not perfect, reflect the substantive feeling of well-being of an individual. In our proposition, satisfaction and happiness regard two different dimensions, dealing with cognitively guided assessment and affective appraisals, respectively. The other three dimensions (health, wealth and safety) represent principal sources of quality of life as several studies have pointed out (Andrews & Withey, 1974; Campbell, 1981; Campbell et al., 1976; Cantril, 1965).

To measure the subjective quality of life latent construct (SQOL) we employed three separated methods assessing the consistency of the results among them. Since the indicators selected to measure SQOL comprise both continuous and ordinal variables, we measured SQOL in three separated steps. First, we performed a confirmatory factor analysis (CFA) on the covariance matrix employing a weighted least squares estimator (implemented as WLSMV in Mplus). WLSMV is especially suitable to model simultaneously variables that are continuous, ordinal and categorical and is a robust estimator that does not assume the normal distribution (Asparouhov & Muthen, 2007). Second, we performed a categorical principal component analysis. Finally, we ran a classical principal component analysis. All the three models pointed out that the selected variables are good indicators of SQOL.

Some of the goodness-of-fit statistics pointed to an acceptable fit for the CFA model on the covariance matrix with CFI = 0.946 ($\chi^2 = 2792$, $N = 54{,}670$, df 5, $p < 0.001$), even though we need to consider that RMSEA (0.10) is above the cut-off point suggested in literature. However, several studies (for example MacCallum et al., 1996) showed that the Chi-square value (and consequently the RMSEA) is strongly affected by large sample size and we performed our analysis on a huge sample. In the situations where RMSEA and CFI are not consistent, Lai and Green (2016) suggested that a researcher should not automatically reject the model but try to explain the inconsistency. Assessing the local fit of the CFA model, we can see that the fit is good. Indeed, all the factor loadings are statistically significant ($p < 0.001$) and are equal to 0.813 for life satisfaction, 0.769 for happiness, 0.613 for subjective economic situation, 0.491 for subjective general health and 0.372 for feeling of safety.

Also categorical PCA provided indication of the unidimensionality of the measures. Indeed, the analysis showed the presence of just one significant component accounting for the 48.5% of the variance with the Cronbach's Alpha equal to 0.734 indicating a good internal consistency. The factor loading are 0.818 for life satisfaction, 0.816 for happiness, 0.707 for subjective economic situation, 0.623 for subjective general health and 0.448 for feeling of safety. Finally, PCA analysis showed the same results, identifying one significant component explaining the 49.3% of the total variance with the factor loadings equal to 0.842 for life satisfaction, 0.825 for happiness, 0.701 for subjective economic situation, 0.602 for subjective general health and 0.472 for feeling of safety.

We used the results of the latter analysis in order to compute a composite indicator of SQOL with values ranging from 0 to 10.[5]

In the next section, we are going to show the results of the multilevel model, assessing the effects of social cohesion, other macro factors, and individual properties (as well as their interactions) on SQOL. In order to carry out the multilevel analysis, we followed the steps suggested by Hox (2010). Precisely, we did the following: first we estimated a null-model (or intercept-only model) in order to assess the need for a multilevel approach, then we built the level-1 model, in the third step added the level-2 covariates and, finally, assessed the interaction effects between social cohesion and some individual level predictors specifying a random-slope model.

4 Results

First, we estimated the intercept-only model (null model) in order to estimate the intraclass correlation coefficient (ICC) for the dependent variable and assess if a multilevel approach is needed. The model has no predictors. Only the intercept is modelled as a random parameter. The model provides the level-1 and level-2 variances useful to compute the ICC. Taking into account that the first-level residual variance (σ^2_e) is estimated as 2.243 and the second-level residual variance (σ^2_{u0}) is 0.686, the ICC is 0.234. Thus, 23% of the variance of the dependent variable SQOL is at the country level. In other words, the country's effect accounts for almost a quarter of the phenomenon. Thus, a not negligible amount of variance in SQOL scores is located at level-2 (country level). Not taking into account the nested structure would lead to an underestimation of the standard errors (Hox, 2010) resulting in an increase of type-1 errors with severe effects on theoretical reasoning.

4.1 First-Level Predictors Only Model

We added individual predictors to the null model, specifying exclusively the individual part of the model without taking into account any second level elements. The residual variance at the individual level (1.410) is obviously considerably smaller than the previous model, which did not include any predictors. All the level-1 predictors account for the 37% of the variability in the subjective quality of life scores. In the same way, the residual variance at the aggregate level (0.467) is considerably smaller than the null model. All the level-1 predictors account also for the 32% of the country level variability in the SQOL scores.

The fixed coefficients are shown in Table 1 (M2 column). All the individual level variables exert a significant effect on SQOL. The strongest positive effect[6] is shown by the variable named "placement in society" through which respondents self-evaluated their position in society. The effect of placement in society is stronger than the total household

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[5] We applied a mathematical transformation in order to convert z-scores in a more user-friendly scale with scores ranging from 0 to 10.

[6] In order to evaluate the importance of each predictor in terms of the effect exerted, the coefficients should be standardised. However, we preferred to not standardise the variables preferring centering method. For further information and pro and cons on centering/standardisation see Kreft, de Leeuw, and Aiken (1995), and Hofmann, and Gavin (1998). In our case, we assessed the relative importance of the individual predictors considering the range of the independent variable. For placement in society ranging from 0 to 10, the impact is equal to 2.61 unit change on the scale of individual quality of life (0 to 10).

net income (see variable "Household income" in Table 1 M2). It seems that the perception that one has about his position in society counts more than the actual economic condition (controlling for other factors) in enhancing quality of life. In a way, this result confirms Easterlin's findings (Easterlin, 2001; Easterlin et al., 2010) that life satisfaction generally rises with income but only up to a certain point and that individual's relative income can actually play a more important role in determining people's quality of life. Other positive predictors refer to religion, political participation, having a permanent employment contract, and education. On the contrary, living in an urban area, feeling of being part of a discriminated group or ethnic minority, being victim of a burglary, being hampered by illness/disability, being divorced, and being unemployed at least for three months affect negatively the SQOL index (Table 1 M2).

4.2 Adding Country-Level Predictors

In the third step, we added the macro-level factors to the model. In order to test Hypothesis 1, we inserted in the model social cohesion, and then life expectancy, gross domestic product, income inequality (measured by Gini coefficient), and homicide rate as macro-level control variables.

In this model the second level variance drops to 0.069 (it was 0.467); therefore the second level predictors (along with the first-level predictors) accounted for 90% of the country-level variance (Table 1 M3 model).

Regarding the fixed coefficients, these are shown in Table 1 (M3).

The first hypothesis stated that living in a country with higher degrees of social cohesion improves subjective quality of life. Controlling for other macro factors—GDP, Life Expectancy, Gini coefficient and Homicide rate—and individual-level variables, social cohesion exerts a significant positive effect on subjective quality of life. The estimated level-2 coefficient for Cohesion is 0.290 ($p = 0.011$). Therefore, considering the range of Social Cohesion (*min* − 1.47, *max* 1.88) there is a difference of 1 unit on SQOL (measured on a 0–10 scale) between countries with the highest level of cohesion and those with the lowest level of cohesion. In other words, those people who live in highly cohesive countries are predicted to have, ceteris paribus, an SQOL score of 1 unit higher compared to those people living in less cohesive countries.

Concerning the other level-2 predictors, life expectancy shows a significant positive effect on SQOL. Instead, the model indicates that country's GDP does not influence the levels of individual quality of life. In the same way, income inequality and homicide rate do not show significant effects controlling for the other factors.

4.3 Assessing Random Slopes and Cross-Level Interaction Terms

In the final step, we assessed whether level-1 predictors—Income and Placement in society—involved in the interactions stated in Hypotheses 2 and 3 have a random slope; that is, whether the slopes have a significant variance across the countries. First, we tested the variable income using the deviance difference test. In the model with "Income" considered a fixed parameter the estimated deviance is 123,682.784; while the estimated deviance in the random slope model is 123,294.535. Therefore, with a difference in the deviances of 388 and one degree of freedom we can conclude that the slope for "Income" significantly varies across countries. Following the same procedure, we tested also "Placement in society".

With a difference of 244 between the deviances of the two models (one with a fixed coefficient, the other with a random coefficient) and 1 degree of freedom, we can conclude that the slope associated with "Placement in society" does significantly vary across the level-2 units.[7]

After testing for the random slope of "Income" and "Placement in society" and establishing their statistical significance, we moved on to test Hypotheses 2 and 3 (if Income and Placement in society were not random parameters it would have made no sense to create interactions with the level-2 predictor Social Cohesion). To actually test Hypotheses 2 and 3, we introduced in the model two cross-level interaction effects. The first one refers to the interaction between Cohesion and Income; the other one concerns the interaction between Cohesion and Placement in society.

All the cross-level interaction effects show significant coefficients (Table 1, M4 model). The interactions between Social Cohesion and the level-1 random predictors accounted for 25% of the variance in Income and 18% of the variance in Placement in society.

The income-cohesion cross-level negative fixed coefficient ($\beta = -0.024$, $p = 0.008$) points out that in a more cohesive society the positive effect of income on quality of life is moderated by cohesion. In other words, income is a relatively less important factor in determining quality of life in highly cohesive countries. Precisely, for each increment in the variable Cohesion (measured in units of standard deviations) the effect of Income decreases by 0.024 units. Thus, for the Countries with the highest level of cohesion and for those with the lowest level of cohesion (see Table 3 for Cohesion's descriptive statistics) the predicted effects of Income are:

$$0.128 - 0.024 * 1.88 = 0.082$$
$$0.128 - 0.024 * -1.47 = 0.163$$

Therefore, the effect of Income on SQOL for Countries with the highest level of cohesion is less strong than that for Countries with an average level of cohesion (the slope is less steep: 0.082 vs 0.128). In the same way, the effect of Income on SQOL for Countries with the lowest level of cohesion is stronger than the effect for Countries with an average level of cohesion (we have a steeper slope: 0.163 vs 0.128).

Similarly, the variable Placement in society, which shows a negative statistically significant coefficient for the interaction term with social cohesion ($\beta = -0.022$, $p = 0.034$), plays a less important role in determining the levels of quality of life within those societies with higher levels of social cohesion. For Countries with the highest level of cohesion and for those with the lowest level of cohesion the predicted effects of Placement in society are:

$$0.257 - 0.022 * 1.88 = 0.215$$
$$0.257 - 0.022 * -1.47 = 0.289$$

In other words, individuals' position and perception of their placement on the social ladder affect in a lesser extent their quality of life in those countries that have higher degrees of cohesion.

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[7] We estimated another model with both the random slopes specified at the same time and tested also for the statistical significance of the covariance of the random part. The difference in the deviances between the model with independent random errors and the model with the covariances specified is not statistically significant ($\chi^2 = 6.595$, $df = 3$).

Table 1 Multilevel models of Individual Quality of Life (IQOL)

	M1: intercept only model		M2: M1 + Level-1 predictors		M3: M2 + Level-2 predictors		M4: M3 + cross-level interactions	
	Estimate	Std. error	Estimate	Std. error	Estimate	Std. error	Estimate	Std. error
Level-1								
Intercept	6.839	.154	7.132	.128	7.113	.053	7.146	.054
Household income			.120***	.002	.118***	.002	.128***	.008
Place in society			.261***	.004	.266***	.003	.257***	.010
Domicile			-.100***	.013	-.097***	.013	-.112***	.013
Discriminated group			-.467***	.024	-.471***	.024	-.457***	.024
Ethnic group			-.124***	.025	-.123***	.025	-.089**	.025
Burglary/assault			-.238***	.016	-.231***	.016	-.232***	.016
Illness/disability			-.743***	.015	-.746***	.015	-.745***	.015
Religion			.020***	.002	.020***	.002	.021***	.002
Divorced			-.159***	.018	-.161***	.017	-.165***	.017
Permanent contract			.044**	.016	.042**	.016	.039*	.016
Contract: Missing[a]			.144***	.019	.134***	.019	.137***	.019
Age			-.008***	.000	-.007***	.000	-.007***	.000
Education			.085***	.014	.087***	.014	.081***	.014
Gender			-.143***	.012	-.151***	.012	-.148***	.012
Unemployed			-.326***	.013	-.324***	.013	-.310***	.013
Close to political party			.110***	.012	.114***	.012	.116***	.012
Level-2								
Cohesion					.290**	.107	.317**	.109
Life expectancy					.090***	.019	.088***	.019
GDP					.002	.005	.002	.005
Homicide rate					-.061	.037	-.051	.038
Gini coefficient					-.003	.017	.002	.017

Table 1 (continued)

	M1: intercept only model		M2: M1 + Level-1 predictors		M3: M2 + Level-2 predictors		M4: M3 + cross-level interactions	
	Estimate	Std. error	Estimate	Std. error	Estimate	Std. error	Estimate	Std. error
Cross-level interactions								
Income*Cohesion							−.024**	.008
Place in society*Cohesion							−.022*	.009
Level-1 residual variance	2.243		1.410					
Level-2 residual variance	.686		.467		.069			
L-1 variance accounted for			37%					
L-2 variance accounted for			32%		90%			
Random slope model								
Variance income							.002	
Variance place in society							.003	
Interaction model								
Income							25%	
Place in society							18%	

***Sig. = .001, ** Sig. = .01, *Sign. = .05

[a]We added a dummy variable adjustment for the variable "type of contract" to account for the missing data (some people cannot have a value on this variable as it cannot be applied to them, like for example inactive respondents)

5 Discussion and Conclusions

A shortsighted approach to welfare focused primarily on economic factors is no longer sufficient to assess the well-being of modern societies. Our study assessed the contribution to quality of life of factors related to societal and cultural aspects. Contrary to earlier conceptualizations in which constituent factors and determinants/consequences of social cohesion were often mixed up, nowadays the research on cohesion agreed upon what actually constitutes cohesion and what are instead the factors that produce or are affected by cohesion (Chan et al., 2006). Some of the previous studies on cohesion considered, amongst the others, quality of life a component of cohesion (for example, Berger-Schmitt, 2002; Council of Europe, 2005; Duhaime et al., 2004). Now the research agreed that cohesion is an antecedent of quality of life and contributes to enhancing it (Schiefer & Van der Noll, 2017). The main aim of this paper was to empirically assess the direct effect of social cohesion on quality of life controlling for country's wealth, economic inequality and other factors considered country-level capabilities. In addition, we also tested the moderating effect of cohesion on the relationship between household income and placement in society with quality of life.

To measure social cohesion, instead of employing a new conceptualisation, new indicators and measures, we used Bottoni's model (2018a) as it has several advantages. The model—and the resulting Social Cohesion variable—is corrected for measurement error, shows measurement invariance across the 29 Countries analysed, and takes into account the aggregate nature of cohesion through a multilevel confirmatory factor analysis approach. To measure individual quality of life instead, we selected 5 indicators and cross-validated the model employing three different techniques.

To test our hypotheses we estimated a multilevel regression model in multiple steps. First, we estimated the null model, which showed that almost a quarter of the variance in SQOL is located at country level. Second, we included in the model all the level-1 predictors. This model highlighted that self-evaluated position on the social ladder has a larger positive effect than household income on SQOL. This suggests that the comparison with other people in society and the perceived relative position of an individual compared to other subjects weights more on quality of life than the mere net income (Easterlin, 2001; Easterlin et al., 2010). That said, it rests assured that the richer, the happier, as also shown by our model (see also Seghieri et al., 2006).

In the third step, we added country-level predictors to test our first hypothesis. We showed that, controlling for other macro factors—GDP, Life Expectancy, Gini coefficient and Homicide rate –Cohesion exerts a positive effect on subjective quality of life. In other words, higher levels of social cohesion in a country contributes to enhance the quality of life of individuals in that specific country. A possible explanatory mechanism regards the fact that cohesive countries tend to create positive aggregate conditions (Bottoni, 2018a) which in turn positively affect individuals' quality of life. Cohesion can be understood as an aggregate country-level capability (Nussbaum, 2011; Sen, 1985) that helps individuals to turn available resources into well-being. It is worth mentioning that when we say "highly cohesive countries" we mean countries that show higher levels of social and institutional trust, social relationships and social support, openness, participation, and legitimacy of the institutions. As said, the social cohesion variable used in this study comes from Bottoni's model (2018a), in which Social Cohesion was a second-order factor accounting for the correlations between seven cohesion constituents (interpersonal trust, density of social

relationships, social support, openness, participation, trust in institutions and legitimacy of institutions), measured by 24 indicators.

The model also points out that country's economic conditions (measured by GDP) do not affect quality of life when we control this relationship for social cohesion. Interestingly, also the within-country economic disparities (measured by Gini coefficient) do not seem to affect quality of life when cohesion is taken into account. We then moved on to test the other two hypotheses. We showed that leaving in a country with higher levels of social cohesion makes the income a less important factor in determining quality of life. Also here, cohesion works as an aggregate factor that helps individuals to turn available non-economic resources into well-being. These resources, as said, can be identified in higher degrees of trust (institutional and personal), more intense social relationships, higher levels of legitimacy of institutions, and higher degrees of social participation. Thus, these resources are used by single individuals and turned into quality of life.

Likewise, we showed that, in highly cohesive countries, the perceived position in a society—whether being on top or bottom—is a relatively weaker driver of quality of life. Again, social cohesion—and the macro resources made available by cohesion—works as macro factor moderating the relationship between societal position and quality of life. The possible mechanism is the fact that cohesion contributes to produce equality and a fairer distribution of the resources in a society (see Vergolini, 2011), which in turn affect individuals' perception of the social structure.

Obviously, our study has some limitations. First, the observational nature and the cross-sectional design of the study prevent the identification of casual relationships and potential longitudinal effects. Second, even though we used a comprehensive, cross-national validated definition of social cohesion derived from Bottoni (2018a), this does not (and cannot) cover all the possible theoretical dimensions, and different conceptions, of social cohesion. Third, the variable household income has more than 20% of missing data. Even though variables related to income have always been problematic in observational studies, we included this variable because, as previous research has shown, it is an important driver of quality of life and is essential for the model to be correctly specified. We did not follow the dummy variable adjustment approach for this variable as it has been extensively showed (Jones, 1996) that this method results in biased estimates, and we wanted to avoid this especially considering that household income has a random slope and is involved in a cross-level interaction term with the cohesion variable. All models have been weighted using post-stratification weights, reducing the impact of nonresponse error and correcting for coverage and sampling error.

To conclude, our study showed that non-economic country-level resources, as social cohesion, are fundamental in modern societies for people's quality of life. We have also seen that at aggregate level, once controlling for Cohesion, country's GDP does not increase individuals' quality of life.

The gap between economic growth and quality of life has never been as large as in modern societies. The new challenges posed to modern societies—climate change, refugees, terrorism, sustainability, renewable energy—demand a less myopic approach. The well-being cannot be exclusively measured in terms of percentage points of the GDP. Even during the COVID-19 pandemic, we have seen that the countries' ability to recovery from the pandemic was measured as proportions of the GDP recovered and the ability to get it back to pre-pandemic period. The cultural and social effects on people's life, after a first preliminary phase, has been totally neglected. We showed instead that cohesion, which means more participation, higher levels of solidarity, higher degrees of trust, increases the quality of life of individual. In this way cohesion can contribute to an economic growth which

is also sustainable. For these reasons, measures of social cohesion, amongst the others, should be the introduced to regularly assess countries' and people's well-being.

Appendix

See Tables 2, 3 and 4.

Table 2 Sample size by country

Country	Sample size	%	Country	Sample size	%
Albania	1201	2.2	Israel	2508	4.6
Belgium	1869	3.4	Iceland	752	1.4
Bulgaria	2259	4.1	Italy	960	1.8
Switzerland	1493	2.7	Lithuania	2109	3.9
Cyprus	1116	2.0	Netherlands	1845	3.4
Czech Republic	2009	3.7	Norway	1624	3.0
Germany	2958	5.4	Poland	1898	3.5
Denmark	1650	3.0	Portugal	2151	3.9
Estonia	2380	4.4	Russian Federation	2484	4.5
Spain	1889	3.5	Sweden	1847	3.4
Finland	2197	4.0	Slovenia	1257	2.3
France	1968	3.6	Slovakia	1847	3.4
United Kingdom	2286	4.2	Ukraine	2178	4.0
Hungary	2014	3.7	Kosovo	1295	2.4
Ireland	2628	4.8	Total	54,672	100.0

Table 3 Predictors of subjective quality of life (SQOL)

Dichotomous predictors	n = 5672	
	Categories	%
Gender	Male	45.6
	Female	54.4
Employment contract	Temporary or no contract	20.6
	Permanent	58.2
	Missing	21.3
Member of a discriminated group	No	91.3
	Yes	7
	Missing	1.3
Domicile	Country, town, farm	65.7
	City or suburbs of city	34.0
	Missing	0.3
Belong to minority ethnic group	No	92.1
	Yes	6.7
	Missing	1.2
Victim of burglary/assault last 5 years	No	83.2
	Yes	16.4
	Missing	0.5
Hampered in daily activities by illness/disability/infirmary/mental problem	No	74.2
	Yes	25.4
	Missing	0.5
Ever been divorced/civil union dissolved	No	84.9
	Yes	14.4
	Missing	0.7
Education	to upper secondary	64.5
	BA, MA	34.9
	Missing	0.7
Unemployed for more than three months	No	69.8
	Yes	29.5
	Missing	0.7
Feel closer to a particular party	No	52.3
	Yes	44.8
	Missing	3.0

Continuous predictors	Min	Max	Mean	Std. Dev	Missing %
Household net income (deciles)	1	10	5.3	2.81	21.2
How religious are you	0	10	4.7	3.07	1
Your place in society	0	10	5.5	1.85	2.3
Age	15	103	46.0	18.70	0.2
[COUNTRY] Social cohesion	−1.47	1.88	0.0	1.00	0
[COUNTRY] GDP per capita at current prices (dollars)	3.8	100.1	31.9	21.08	2.4
[COUNTRY] Gini coefficient of equivalised disposable income	22.6	37.0	29.5	3.92	2.4
[COUNTRY] Life expectancy at birth (years)	69	83	78.4	3.80	2.4

Table 3 (continued)

Continuous predictors	Min	Max	Mean	Std. Dev	Missing %
[COUNTRY] Intentional homicide, rate per 100 000	0.6	9.7	2.5	2.62	2.4

Table 4 Indicators of subjective quality of life (SQOL)

Ordinal indicators	Categories	%
Feeling of safety of walking alone	Very unsafe	5.1
	Unsafe	19.8
	Safe	49.7
	Very safe	25.4
Subjective general health	Very bad	1.5
	Bad	7.6
	Fair	27.6
	Good	40.6
	Very good	22.7
Feeling about household's income	Very difficult on present income	11.0
	Difficult on present income	22.5
	Coping on present income	42.8
	Living comfortably	23.7

Continuous indicators	Min	Max	Mean	Std. Dev
How happy are you	0	10	7.11	2.100
How satisfied with life as a whole	0	10	6.76	2.405

Declarations

Conflict of interest The authors declare that they have no conflict of interest.

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