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Income-based social stratification of life satisfaction in Ireland between 2004 and 2014

Introduction

Subjective well-being (SWB)¹ is currently of increasing interest to social scientists and there is now a rich literature on life satisfaction and its socio-economic correlates identified using individual level data (see e.g. Diener et al., 1999). One field of SWB research uses country-level analyses to study the relationship between aggregate life satisfaction and macroeconomic indicators, such as Gross Domestic Product (Easterlin, 1974; Easterlin et al., 2010; Frank, 2009; Helliwell, Layard, & Sachs, 2012; Stevenson & Wolfers, 2008). A related and growing research perspective has focused on studying the effects of short-term macroeconomic changes, such as the negative impact of economic recession on personal levels of subjective well-being (Bell and Blanchflower, 2010; Bjørnskov, 2014; Blanchflower & Oswald, 2004; Deaton, 2011; Guardiola, Picazo-Tadeo, and Rojas, 2015; Gudmundsdottir, 2013; Helliwell, Huang, and Wang, 2014; Mertens and Beblo, 2016; OECDa, 2013).

Recent studies examining the implications of short-term economic changes have found that, on aggregate, life satisfaction tends to decrease during economic crisis (e.g. Helliwell, Huang, and Wang, 2014; Mertens and Beblo, 2016; OECDa, 2013). Moreover, there is

evidence that this effect runs mainly through economic mechanisms such as increases in the level of unemployment (Bell and Blanchflower, 2010; Di Tella, MacCulloch, and Oswald, 2003; Mertens and Beblo, 2016) in subjective economic hardship (Gudmundsdottir, 2013).

Studies on health shed further light on what happens to well-being in times of recession.

There is evidence that worsened economic conditions may impose serious health risks (Musgrove 1989; Leon et al. 1997), but health has also been found to improve during recessions (Khang et al. 2005; Kondo et al. 2008). Also, the shape of the distribution matters.

There are findings on increased socio-economic health inequalities following recession (Kondo et al. 2008), but also on more beneficial impact of recession on inequalities (Valkonen et al. 2000). Khang et al. (2005) propose that the health impact of an economic crisis may depend on both the nature of the crisis (depth and length) and the society in question, which may explain otherwise paradoxical findings. As the literature on health shows, recession may matter in terms of well-being. Drawing on these approaches, we study here the socio-economic inequalities of life satisfaction, a commonly used measure of subjective well-being, in the context of the most recent economic recession in Ireland.

In addition to individual level correlates of life satisfaction inequality has featured as a macro-level variable (Alesina, Di Tella, and MacCulloch, 2004; Delhey and Dragolov, 2014; Haller and Hadler, 2006; Oishi and Kesebir, 2015; Rözer and Kraaykamp, 2013; Schröder, 2016; Verme, 2011), and as approached through income inequality, e.g. GINI-index, in line with the framework of Wilkinson and Pickett (2010). A sociological response and critique to this line of research was made by Goldthorpe (2010) who has criticized one-dimensional conceptualization of social inequality as failing to recognize structural disadvantages associated with the categorical social position (i.e. occupational class) of individuals.

Thereby, this analysis departs from studies focusing on the macro-level contextual effects of income inequality by focusing on individual level socio-economic variables and stratification over time within a single society.

This in-depth examination of socio-economic stratification of life satisfaction, and its temporal development in a society fills an important gap in the current literature. It is also a step towards building a bridge between sociology and SWB studies, which have remained relatively distinct (see e.g. Delhey and Dragolov, 2014: 151, and Wolbring et al. 2013: 86). Furthermore, recent analysis studying the complex relationship between inequality and life satisfaction suggest that it is in fact short-run increases in inequality which influence the level of life satisfaction in a country rather than long-run levels of inequality (Schröder, 2016). This suggests that a stronger focus should be placed on short-term changes within a country (e.g. a period of economic crisis) instead of relying on cross-sectional analyses comparing countries with different levels of income inequality.

As the literature cited above shows, the published findings regarding the well-being effects of the changes in both macroeconomic conditions and inequality are rather inconsistent, which may reflect the relative autonomy of subjective well-being measures from economic conditions. Furthermore, it can be argued that as the evaluative measures of SWB are sensitive to hedonic adaptation and social comparison, the inequalities of subjective well-being are best analysed either relatively, between groups, or during periods of dramatic change². This analysis takes the recent economic recession in Ireland as a ‘natural experiment’, one which allows us to address both of the issues above while focusing on short-term changes within a single country.

In this analysis, socio-economic stratification is approached from three perspectives: education, occupational class and income. Stratification of life satisfaction is tracked during the economic crisis while including controls for demographic composition. As far as the authors are aware, this study is the first to be built on such a framework. Thereby, we aim to contribute to both sociological research on inequality and also to the literature studying the relationship between economic recession and subjective well-being.

The repeated cross-sectional data used in this analysis is derived from the biannual European Social Survey (ESS). Ireland is one of the few countries taking part of the ESS from the beginning of that survey and thus we choose to focus on a ten-year time frame of 2004 to 2014. Ireland serves as a good case for this study because it is one of the countries where the effects of economic crisis were felt hardest in terms of economic indicators (OECDa, 2013) and in decreases in subjective well-being (Helliwell et al., 2014). Furthermore, in Ireland a variety of so-called “austerity measures” were applied in order to tackle the effects of the crisis which provides a reason to expect significant short-term increase in inequality in both economic and subjective terms.

The research questions are as follows:

- 1) Are all three dimensions of socio-economic stratification (education, occupational class, and income) of equal importance for life satisfaction?
- 2) How is the structure of stratification affected by the economic crisis?
- 3) What is the role of economic indicators (unemployment and economic hardship) and social trust (interpersonal and institutional trust) in the stratification of life satisfaction during the crisis?

Subjective well-being, inequality and stratification: conceptual and empirical perspectives

Socio-economic inequalities in different aspects of well-being, including various psychosocial indicators (Wilkinson and Pickett, 2010), have gained abundant attention in the sociological literature. Furthermore, there is a now rich body of literature studying the contextual macro-level effects of income inequality on life satisfaction between and within societies (Alesina et al., 2004; Delhey and Dragolov, 2014; Oishi et al. 2011; Oishi and Kesebir, 2015; Rözer & Kraaykamp, 2013; Schneider, 2016; Schröder, 2016; Verme, 2011).

However, as earlier remarked, most interest has been placed on a contextual effect of inequality as a measure, for instance, by the GINI-index, and the effect that inequality has on the overall level of subjective well-being in a country. Because Goldthorpe (2010) has criticized the framework and the conceptualization of inequality in this line of research and has argued that focusing only on a macro-level and income inequality is too one-dimensional we take his concerns on board here. Goldthorpe (2010: 733) claims that the conceptualization of inequality into social stratification is able to reveal inequality which is inherent in prevailing forms of social relationships that have in some degree an institutional basis. As an example, Goldthorpe (2010: 734) refers to a large body of evidence showing that individuals' risk of unemployment and other economic disadvantages is strongly associated with their class positions.

Extending this perspective, we direct our attention not only to occupational social class, but also education and income in order to examine more nuances of the social structure of life satisfaction, and its temporal dynamics in relation to acute economic crisis. With the framework we have presented we acknowledge the discussion on how social inequalities

should be operationalized (Grusky, 2007) and ask does inequality indeed take a class form as Goldthorpe (2010) and other class researchers claim? Also, instead of engaging in normative debate on inequality, we aim to provide a multidimensional empirical description of its temporal development during economic crisis (see e.g. Savage 2016).

One further issue is whether to approach stratification from a categorical or a continuous perspective. In the categorical approach, mechanisms allocating resources to different socio-economic groups are of key importance. This type of framework assumes that there are bundled disadvantages associated with certain institutionalized groups (i.e. classes), based on, for example, the level of education or type of occupation. Also, different dimensions of socio-economic stratification (income, education and occupation) may imply different mechanisms at work. For example, having only basic education could limit individual possibilities to enter labor markets, resulting in lower life satisfaction. Additionally, there might be different psychological pay-offs associated with manual or non-manual work leading to different level of life satisfaction. Regarding the income and life satisfaction relationship, the possible mechanisms could work through fulfilling basic needs or the effect of relative income and social comparison. It is the relationship between these different dimensions of stratification this study aims to disentangle.

Applying a quintessentially sociological and structuralist approach to conceptualize inequality through socio-economic stratification and following its development over time is what separates this analysis from the already mounting literature on inequality and life satisfaction (Alesina et al., 2004; Delhey and Dragolov, 2014; Oishi et al. 2011; Oishi and Kesebir, 2015; Rözer & Kraaykamp, 2013; Schneider, 2016; Schröder, 2016; Verme, 2011).

In what follows, we consider the variables and mechanisms which can be assumed to affect individual level life satisfaction and changes of life satisfaction during economic crisis. We present results from the existing literature and then draw hypotheses to be tested in the present study.

Mechanisms affecting life satisfaction

This chapter describes the mechanism operating between socioeconomic indicators (income, education and occupational class) and life satisfaction based on the existing literature.

Unemployment

Unemployment is one of the strongest negative predictors of life satisfaction at the individual level, but the impact is not completely explained by the much lower benefit payment income of the unemployed (Clark & Oswald, 1994; Di Tella et al., 2003). Studies have also examined variations in the level of unemployment as a contextual measure. It has been suggested that the national unemployment rate has a negative contextual effect on well-being as it reflects general uncertainty and the level of social tensions in a society (Mertens & Beblo, 2016). Empirical analyses have found diverse results for this claim such as Alesina et al. (2004) who found negative effects for the United States but not for a set of European countries. Increased level of unemployment has also been considered to have a positive effect to life satisfaction. This would work through social norms as a higher level of unemployment could make being unemployed less stigmatizing (see e.g. Stutzer & Lalive, 2004). Empirical analyses have found mixed evidence for the effect of social norms of

unemployment (Chadi, 2014; Clark, 2003; Mertens & Beblo, 2016). Also, the question of determining the reference group for these social norms is unresolved.

Income and economic hardship

There is abundant evidence on the relationship between life satisfaction and individual or household income (Boyce, Brown, and Moore, 2010; Deaton, 2008; Hou, 2014; Oswald and Wu, 2010; Stevenson and Wolfers, 2013; Wolbring et al., 2013). The discussion has concentrated on whether this association is due to absolute, relative or rank income, which each refer to different hypotheses and mechanisms (Boyce et al., 2010). First, the absolute income hypothesis understands well-being mainly through access to material goods and consumption (Bruni & Porta, 2007), and assumes that income and life satisfaction are directly and causally linked as higher incomes increase the possibility to purchase goods and services according to one's personal preferences leading to higher satisfaction. Second, the relative income hypothesis acknowledges the role of social comparisons (Hou, 2014; Luttmer, 2005). It suggests that, in addition to possibilities for material consumption, individuals are sensitive to how their income relates to the reference income of a socially constructed comparison group. Third, the income rank hypothesis assumes that it is the number of people (or households) who rank higher or lower compared to oneself which matters most for life satisfaction (Boyce et al., 2010; Powdthatee, 2009).

A comprehensive study by Boyce et al. (2010) addressing all of these hypotheses found that ranked income best predicts general life satisfaction, whereas absolute and reference income have no effect. They also noted that individuals weight upwards comparisons (ranks) more heavily than downward comparisons. To conclude, the individual level relationship between

income and life satisfaction has proven to be complex and recent studies have shown that income loss has a significantly greater effect on life satisfaction than equivalent income gains (Boyce, Wood, & Ferguson, 2016). At the individual level personality traits interact strongly with increases in income to determine life satisfaction (Boyce and Wood, 2011).

Those studies which have analyzed the income and life satisfaction from the perspective of experienced deprivation have shown that the experience of subjective economic hardship is negatively associated with life satisfaction even after taking into account the income of respondents (Gudmundsdottir, 2013; Reeskens and Vandecasteele, 2016). Studies have also shown that good social networks and higher institutional trust cushion the negative effects of economic hardship on levels of SWB during an economic crisis (Reeskens and Vandecasteele, 2016). Finally, Mühlau (2014) analyzed the subjectively experienced effects of economic recession in different socioeconomic groups focusing on the Irish context. Mühlau (2014) concluded that financial hardship increased most for the working classes. Similar results have been presented by Whelan and Maître (2014) showing that economic vulnerability is highly stratified by social class.

To conclude, studying both objective (household income) and subjective (economic hardship) dimensions can shed additional light on the complex relationship between income and life satisfaction. A certain level of income is essential for covering basic needs such as shelter, food and clothing. Thereby, accounting for subjective economic hardship can be assumed to control for lack of material deprivation, which could explain at least part of the stratification revealed in this study.

Social trust indicators

The positive relationship between the levels of social trust and life satisfaction at country level is well documented (Helliwell et al., 2014; Helliwell, 2008). Moreover, cross-sectional analyses in modern affluent societies have found that interpersonal trust is strongly stratified (Hamamura, 2012). A study by Oishi et al. (2011) added a temporal perspective to this thesis and discovered the long-term change in life satisfaction experienced by lower income groups was not explained by changes in household income, but by increased perceived unfairness and decreased interpersonal trust. In addition, Delhey and Dragolov (2014) found that interpersonal trust cushions the relationship between inequality as measured by GINI and life satisfaction.

Furthermore, some studies that have focused on a period of economic crisis and documented a decrease in interpersonal and institutional trust (Bjørnskov, 2014; Habibov & Afandi, 2015; Helliwell et al., 2014). Helliwell et al. (2014) and Gudmundsdottir (2013) have shown that interpersonal trust moderates the loss of life satisfaction during a period of economic crisis. Habibov & Afandi (2015) added more detail to this thesis and analyzed pre- and post-crisis life-satisfaction in transitional countries, and found that institutional trust decreased after crisis, while interpersonal trust increased.

To conclude, the results of published research on the changes of social trust during economic crisis appear rather diverse and there is no consensus over whether interpersonal and institutional trust both decrease during economic crisis. Furthermore, the sub-group specific effects of these changes remain mainly unexplored.

Research hypotheses

Regardless of some inconsistency in the above literature addressing the mechanisms affecting life satisfaction and the effect of economic recession the following research hypotheses for this analysis could be drawn.

H1: Unemployment and economic hardship are assumed to increase during the crisis whereas social trust (interpersonal and institutional trust) is assumed to decrease. Moreover, we expect that these changes are experienced most in the lower classes.

H2: Based on the extensive evidence on the role of income, we expect that it is a key stratifying factor of life satisfaction even after controlling for education and occupational class.

H3: We expect that income stratification of life satisfaction runs mainly through subjective experience of economic hardship, regardless of whether the effect is caused by insufficient possibilities for consumption or relative or rank income.

H4: As the risk of unemployment is socially stratified, we expect that occupational class and education gain importance in terms of life satisfaction during the crisis.

Data, indicators and methods

Data

Repeated cross-sectional data on Ireland from the European Social Survey was used in the study. Rounds from two (2004) to seven (2014) were utilized, providing a timespan of ten years. The cumulative dataset was produced on November 26th, 2015. An advantage of the

ESS data is that it provides not only sampling weights, but also adjusted post-stratification weights tackling non-response (European Social Survey, 2014).

Indicators

The outcome variable on life satisfaction was measured with the question “*All things considered, how satisfied are you with your life as a whole nowadays*”, with a numeric response scale ranging from zero (“*Extremely dissatisfied*”) to ten (“*Extremely satisfied*”). The three variables describing social stratification were constructed with the aim of finding an optimal balance between details and parsimony, with the following solutions. Our tripartite classification of education level was based on the International Standard Classification of Education (ISCED): tertiary (ISCED levels 5 and 6), secondary (3 and 4) and basic (0 to 2). Occupational social class was constructed using the Eriksson-Goldthorpe-Portocarero scheme (Ganzeboom & Treiman, 2001) and a three-class categorisation was constructed, yielding manual, non-manual and farming occupational classes (Erikson & Goldthorpe, 1992). The total net household income was categorised into three classes using the lower and upper quartiles as boundaries, separately for each data round; the cut-off points were chosen as close to the mentioned quartiles as possible, depending on the shape of the distribution for the given year. The mediator variables included unemployment, subjective economic hardship, interpersonal trust, and institutional trust.

Variables indicating trust were calculated from the relevant items in the ESS core module. The ‘institutional trust’ variable was a sum variable based on the following survey question used for measuring trust: “*On a score of 0-10 how much you personally trust each of the following institutions: [country]’s parliament, the legal system, the police, politicians, political parties, the European Parliament, the United Nations*”

The 'Social trust' variable combined three survey items asking the following questions with 10-point scale: *"Would you say that most people can be trusted, or that you can't be too careful?"*, *"Do you think that most people would try to take advantage of you if they got the chance, or would they try to be fair?"*, *Would you say that most of the time people try to be helpful or that they are mostly looking out for themselves?"* Cronbach's α for trust variables were as follows: interpersonal trust scored 0.70 in 2008 and 0.80 in 2010 and institutional trust 0.86 for both 2008 and 2010.

'Economic hardship' was measured through a single survey item with the following question and four possible responses: *"Which of the descriptions on this card comes closest to how you feel about your household's income nowadays? 1) Living comfortably on present income, 2) Coping on present income, 3) Finding it difficult on present income, 4) Finding it very difficult on present income"*.

Socio-demographic control variables used in the analysis were gender, age, and age squared.

Methods and analytical strategy

This study is based on OLS- regression, and the weights correcting the impact of sampling design and non-response (post-stratification weights) were used in all our analyses, with the Complex Samples module in SPSS (version 22).

Our analytical strategy was as follows. First, the means in life satisfaction were estimated yearly along the three stratification dimensions, using the available weights, and the results were visualised. Based on an inspection of the trends and on prior knowledge of the macro-economic changes, years 2008 and 2010 were chosen for further regression examination.

First, all stratification variables were included in the same model with life satisfaction as the dependent variable. Next, the role of subjective economic hardship, unemployment as well

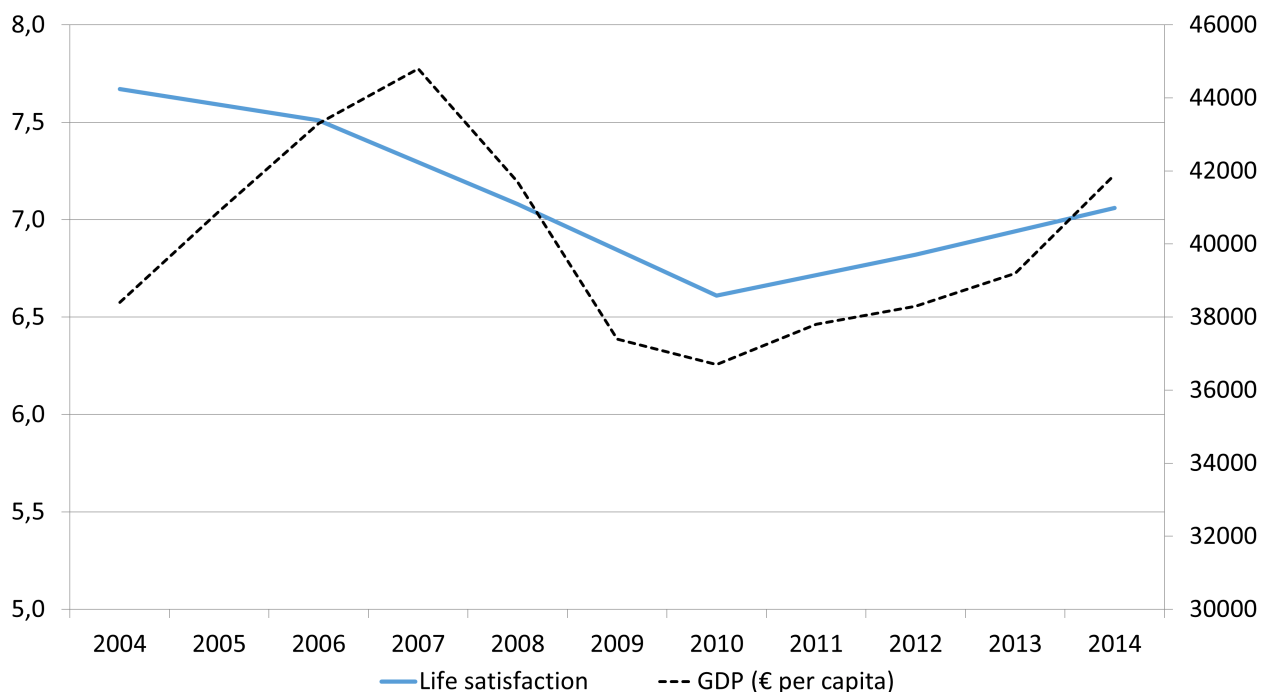
as interpersonal and institutional trust was studied by adding them individually to the model. We then we tested the results obtained from the 2008 and 2010 data by an interaction analysis between socioeconomic indicators and time using a pooled dataset from 2004 to 2014.

Results

Life satisfaction, GDP and stratification: a temporal description

The initial step in the empirical part of this analysis is to see how the economic crisis in Ireland was reflected in terms of life satisfaction. Thereby, mean life satisfaction and level of GDP during a period of 2004 to 2014 are presented in the Figure 1 below.

Figure 1. Mean life satisfaction and GDP/capita in Ireland between 2004 and 2014.



Note: Data from European Social Survey (life satisfaction) and Eurostat (GDP), post-stratification weights included.

Even though the relationship of life satisfaction and GDP is rather inconsistent before the onset of crisis in 2008, we see that the trough of the economic crisis was reached in 2010 in both measures. After this point both life satisfaction and GDP started to recover. The next step is to ask how these changes are reflected in the socio-economic stratification of life satisfaction. Descriptive results are presented in Figure 2 below.

Figure 2. Socio-economic stratification of life satisfaction in Ireland between 2004 and 2014 based on education (2a), occupation (2b), and income (2c).



Note: Data from European Social Survey, post-stratification weights included.

Our main conclusions drawn from Figure 2 are as follows. First, the decrease in life satisfaction was not of equal magnitude in all classes but lower classes were more affected. Second, income based stratification (Figure 2c) showed the most significant divergence

between classes. Moreover, life satisfaction appeared to be stratified rather inconsistently before the crisis. For example, the group classified as “basic or less” educated in Figure 2a had the highest life satisfaction in 2006 and 2008 but during the crisis in 2010 the order between the classes is more as one would expect (6.37, 6.58 and 6.96 for basic, middle and tertiary educated). In Figures 2b and 2c life satisfaction is stratified as expected. The upper strata have the highest life satisfaction during the whole period, but the divergence between the classes increased during the crisis. An anomaly to this trend is the exceptionally high life satisfaction of farmers during the whole period³.

To conclude, Figure 2 confirms the time frame between 2008 and 2010 as most relevant for investigating the stratification of life satisfaction. Before this the differences in life satisfaction were significantly smaller and showed inconsistent patterns. Hence, this period from 2008 (pre-crisis) to 2010 (during crisis) serves as a temporal frame for the remaining analysis. Year 2010 was also the year when GDP was at its lowest and furthermore, the GINI index, as an indicator of “objective” economic inequality increased between 2008 and 2010 from 29.90 to 30.70 (data from the World Bank) which was the largest annual change within the time frame of 2004 and 2014.

Social and economic indicators in 2008 and 2010: a description of stratification

We next present the descriptive statistics for our key indicators of economic (unemployment and economic hardship) and social (interpersonal and institutional trust) mechanisms according to the three stratification schemes, both in 2008 and 2010. This allows us to see how these categories are stratified in terms other than life satisfaction and

also how socio-economic stratification changed during the crisis. These descriptive statistics are presented in Table 1 below.

Table 1. Means and (standard deviations) of main variables in 2008 and 2010 in different stratification schemes

Stratification scheme									
	Income			Occupation			Education		
Variable	2008	2010		2008	2010		2008	2010	
<i>Unemployment</i>									
Lower quartile	0.21 (0.41)	0.33 (0.47)	Manual	0.20 (0.40)	0.23 (0.42)	Basic	0.12 (0.32)	0.17 (0.38)	
Middle quartiles	0.12 (0.32)	0.17 (0.37)	Farm	0.06 (0.24)	0.10 (0.31)	Secondary	0.13 (0.34)	0.14 (0.35)	
Upper quartile	0.04 (0.19)	0.07 (0.26)	Non manual	0.07 (0.26)	0.10 (0.29)	Tertiary	0.11 (0.31)	0.10 (0.30)	
Total	0.11 (0.32)	0.16 (0.37)	Total	0.12 (0.32)	0.14 (0.35)	Total	0.12 (0.32)	0.14 (0.35)	
<i>Economic hardship</i>									
Lower quartile	2.40 (0.86)	2.68 (0.87)	Manual	2.14 (0.83)	2.38 (0.91)	Basic	2.05 (0.81)	2.35 (0.89)	
Middle quartiles	2.04 (0.79)	2.37 (0.88)	Farm	2.02 (0.78)	1.82 (0.79)	Secondary	1.98 (0.80)	2.22 (0.86)	
Upper quartile	1.53 (0.63)	1.87 (0.75)	Non manual	1.86 (0.80)	2.09 (0.85)	Tertiary	1.87 (0.82)	1.97 (0.86)	
Total	1.96 (0.82)	2.23 (0.89)	Total	1.97 (0.82)	2.17 (0.88)	Total	1.95 (0.82)	2.19 (0.88)	
<i>Interpersonal trust</i>									
Lower quartile	5.71 (1.67)	4.74 (1.88)	Manual	5.66 (1.67)	5.39 (1.82)	Basic	5.78 (1.73)	5.27 (1.93)	
Middle quartiles	5.76 (1.60)	5.28 (1.77)	Farm	6.15 (1.61)	6.06 (1.82)	Secondary	5.79 (1.53)	5.68 (1.78)	
Upper quartile	6.07 (1.45)	5.87 (1.71)	Non manual	5.90 (1.50)	5.81 (1.75)	Tertiary	5.90 (1.48)	6.02 (1.63)	
Total	5.84 (1.58)	5.41 (1.82)	Total	5.83 (1.57)	5.68 (1.79)	Total	5.83 (1.58)	5.64 (1.82)	
<i>Institutional trust</i>									
Lower quartile	4.40 (1.72)	4.05 (1.57)	Manual	4.45 (1.78)	4.11 (1.78)	Basic	4.49 (1.82)	4.16 (1.72)	
Middle quartiles	4.55 (1.67)	4.20 (1.75)	Farm	4.85 (1.73)	5.31 (2.07)	Secondary	4.62 (1.70)	4.49 (1.78)	
Upper quartile	4.94 (1.57)	4.80 (1.71)	Non manual	4.58 (1.60)	4.52 (1.67)	Tertiary	4.69 (1.59)	4.76 (1.67)	
Total	4.634 (1.66)	4.42 (1.73)	Total	4.55 (1.68)	4.43 (1.76)	Total	4.61 (1.70)	4.45 (1.74)	

First, concerning the income-based stratification (column on the left) in Table 1, it appears that unemployment increased in all classes but the lower quartile was most affected (change

from 0.21 in 2008 to 0.33 in 2010). Second, and in contrast, economic hardship increased in all quartiles rather similarly. Third, the single most significant change in Table 1 as a whole took place in interpersonal trust in the lowest income quartile where it dropped from 5.71 in 2008 to 4.74 in 2010. Fourth, on institutional trust the lower income quartile appears to be more negatively affected than other quartiles, although the decrease is not as dramatic as in interpersonal trust.

In the occupation-based stratification all classes showed similar increase in unemployment. Economic hardship increased among both manual and non-manual workers, but in the case of farmers it, interestingly, decreased from 2008 to 2010. Both interpersonal and institutional trust decreased most among manual workers. Again, farmers showed a curiously inconsistent development.

In the education-based stratification the highest increase in unemployment was among those with lowest education, whereas tertiary educated showed a modest decrease (0.11 in 2008 to 0.10 2010). Economic hardship increased in all classes, but individuals with basic or less education were slightly more affected. Finally, both interpersonal and institutional trust showed a rather dramatic pattern, with a marked decrease among the least educated, but a slight increase among those with tertiary education.

Overall, the descriptive statistics presented in Table 1 confirm the first research hypothesis (H1) with some reservations. In general, decrease in interpersonal and institutional trust was not experienced equally but the lower classes were more affected and the most significant decrease was experienced by the lowest income quartile. Instead, subjective economic hardship increased during the crisis as was expected but the effect was more equally experienced between the classes (with the exception concerning farmers). Finally, increase

in unemployment was most dramatic among those with only basic education or belonging to the lowest income quartile.

Regression analyses

The final part of the empirical analysis is to study how life satisfaction is associated with the three variables of socio-economic stratification (income, education, occupation) before and during the crisis, following the analytical strategy outlined earlier.

Table 2. Regression models for life satisfaction, year 2008 (n = 1439).

	I: Stratification		Ila: I + unemployment		Ilb: I + hardship		Ilc: I + inter- personal		Ild: I + institutional trust		III: full	
	B	Sig.	B	Sig.	B	Sig.	B	Sig.	B	Sig.	B	Sig.
Education												
Basic	-0.10	.	-0.10	.	0.04	.	-0.03	.	-0.03	.	0.11	.
Secondary	0.07	.	0.06	.	0.13	.	0.11	.	0.10	.	0.16	.
Tertiary	.	.	.	.	.	.	.	.	.	.	.	.
Occupational class												
Non manual	0.00	.	-0.06	.	-0.07	.	0.00	.	0.03	.	-0.10	.
Farmer	0.26	.	0.13	.	0.33	.	0.15	.	0.22	.	0.12	.
Manual	.	.	.	.	.	.	.	.	.	.	.	.
Income												
Lower quartile	-1.08	***	-0.84	***	-0.29	.	-0.95	**	-0.95	***	-0.10	.
Middle quartiles	-0.56	***	-0.46	***	-0.13	.	-0.46	**	-0.47	***	-0.01	.
Upper quartile	.	.	.	.	.	.	.	.	.	.	.	.
Economic mechanisms												
Unemployment	.	.	-1.22	***	.	.	.	.	.	.	-0.86	***
Subjective deprivation	.	.	.	.	-0.85	**	.	.	.	.	-0.70	***
Social mechanisms												
Inter-personal trust	.	.	.	.	.	.	0.29	**	.	.	0.23	***
Institutional trust	.	.	.	.	.	.	.	.	0.22	***	0.12	**
Intercept	8.87	***	9.07	***	9.69	***	7.25	***	7.41	***	7.64	***
R squared	0.06		0.09		0.15		0.11		0.09		0.20	

Note 1: + $p \leq 0.10$, * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$.

Note 2: in all models, we controlled for gender, age and age squared.

First, while including all stratification variables to the model (Model I in Table 2), it appears that in 2008 life satisfaction is stratified only along the income dimension confirming our second research hypothesis (H₂).

Table 3. Regression models for life satisfaction, year 2010 (n = 1501).

	I: Stratification		Ila: I + unemployment		Ilb: I + hardship		Ilc: I + inter-personal trust		Ild: I + institutional trust		III: full	
	B	Sig.	B	Sig.	B	Sig.	B	Sig.	B	Sig.	B	Sig.
Education												
Basic	-0.57	**	-0.59	**	-0.54	**	-0.32	.	-0.40	*	-0.26	.
Secondary	-0.19	.	-0.22	.	-0.15	.	-0.15	.	-0.15	.	-0.13	.
Tertiary	.	.	.	.	.	.	.	.	.	.	.	.
Occupational class												
Non manual	0.36	*	0.29	+	0.30	+	0.32	*	0.26	.	0.19	.
Farmer	0.74	*	0.70	*	0.53	+	0.65	*	0.38	.	0.30	.
Manual	.	.	.	.	.	.	.	.	.	.	.	.
Income												
Lower quartile	-1.50	***	-1.27	***	-1.11	***	-1.16	***	-1.31	***	-0.71	***
Middle quartiles	-0.68	***	-0.60	***	-0.44	**	-0.52	***	-0.53	***	-0.26	.
Upper quartile	.	.	.	.	.	.	.	.	.	.	.	.
Economic mechanisms												
Unemployment	.	.	-0.76	***	.	.	.	.	.	.	-0.59	**
Subjective deprivation	.	.	.	.	-0.46	***	.	.	.	.	-0.28	**
Social mechanisms												
Inter-personal trust	.	.	.	.	.	.	0.36	***	.	.	0.29	***
Institutional trust	.	.	.	.	.	.	.	.	0.31	***	0.18	**
Intercept	8.73		8.85		9.38		6.64		6.85		6.48	
R squared	0.13		0.14		0.15		0.20		0.18		0.24	

Note 1: + $p \leq 0.10$, * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$.

Note 2: in all models, we controlled for gender, age and age squared.

Moreover, before the crisis education is not significant. This is true even in a bivariate model (not presented in these tables). Examining the contributions of different mediators shows that both economic (unemployment and subjective economic hardship) and social

mechanisms (inter-personal and institutional trust) are at play (full model III). However, the subjective economic hardship seems to be the key factor that explains the income stratification of life satisfaction (model IIb). Once this variable is included to the model (IIb and III), belonging to the lowest income quartile does not have a negative impact on life satisfaction confirming our third research hypothesis (H 3).

Table 3 shows that in 2010 (during the crisis period) the stratification of life satisfaction deepened and took a more multidimensional nature.

For example, the difference between the lowest and highest income quartiles increases from 1.08 units in 2008 to 1.50 units in 2010 (Model I in Tables 2 and 3). Moreover, income is no longer the sole stratification dimension, as now also education and occupational class matter (Model I in Table 3). These results confirm our fourth research hypothesis (H 4) which was designed to test whether other dimensions of stratification gain strength during the crisis. However, the economic dimension is the most important of all, as seen when comparing the effects of the three stratification variables in model III.

Overall, in 2010, the picture is more diverse regarding the role of mechanisms, all of which remain significant predictors in the full model (Model III in Table 3). In terms of educational stratification, inter-personal trust is the strongest mediating factor (Model IIc), while institutional trust mediates most of the impact of occupational class (Model IId). The case of income is more fine-grained, with subjective economic hardship being still the strongest individual mediator. However, the differences in the coefficients compared to the full model are relatively large, which means that the other mediators matter as well. Also, subjective economic hardship no longer completely explains the negative impact of lowest income quartile as it did in 2008 (Table 2).

Finally, we also wanted to test the results described above based on two cross-sectional models on 2008 (Table 2) and 2010 (Table 3) by including additional time points to the analysis. We first pooled the datasets from 2004 to 2014 and then categorised ESS rounds into three time periods, namely before 2010, 2010 and after 2010. Taking the model with three stratification (education, occupational class and income) and demographic variables as the starting point, we added the interactions of stratification variables with the time variable into the model, and eliminated the non-significant interactions one by one on the basis of their predictive power. Following this procedure, we ended up with a model where income and education interacted with the time variable. First, the impact of income on life satisfaction was significantly stronger in 2010 than before. Second, education came to have an independent association with life satisfaction from 2010 onwards ($p < 0.0005$).

To conclude, the results obtained with interaction analysis of pooled data are consistent with interpretations made from 2008 and 2010 data with an addition that the effect of education as stratification factor seems to persist during the immediate post-crisis period.

Robustness testing

During the crisis, item non-response increased considerably in the variable on household income. In 2008, there were only 100 refusals, whereas in 2010 the number was 541. We wanted to examine the possible implications of this and constructed an imputation model for household income, using education, subjective hardship, occupational status, gender and age as predictors. We estimated the parameters of this model for those respondents who had provided information on their household income ($R^2: 0.37$), and used this new model to

predict values for those who had refused to answer. Thus, we obtained a considerably larger dataset to be used for robustness checking purposes (n=1949 with vs. 1501 without imputation). The results of the full models with the original data and the imputed data were consistent, and lead to the same substantial conclusions.

Conclusions and discussion

Returning to the initial research questions of the study, our main findings are as follows:

- 1) The different dimensions of socio-economic stratification are not of equal importance for life satisfaction. Income is the most important stratifying factor.
- 2) The structure of stratification is significantly affected by a period of economic crisis. Our results show that the structure of stratification of life satisfaction is not constant over time but the period of economic crisis has a strong impact on it. Before a crisis, income is the only significant dimension of socio-economic stratification, but then during a crisis, education and occupational class also come to have independent impacts on life satisfaction. Additionally, after appearing during the peak of crisis in 2010 as a predictor of life satisfaction, the effect of education seems to be enduring also in the immediate post-recession period.
- 3) The role of different social and economic mechanisms in stratification are not constant in time. Before a crisis, the income stratification of life satisfaction is completely mediated by subjective economic hardship, while during the crisis the mediation structure becomes more complex.

The novel contribution of this study has been to examine the changes in life satisfaction within the temporal frame of an economic crisis from the perspective of socio-economic

stratification. The results show that the structure of stratification is not constant over time but instead it is strongly modified by short-term changes in macro-economic conditions. Hence, this study has demonstrated that it is not enough to approach inequality as a one-dimensional contextual measure in the studies on SWB (as noted also in Delhey and Dragolov, 2014: 161).

Our results are in line with studies showing that economic crisis is associated with a decrease not only in life satisfaction but also in social trust (Gudmundsdottir, 2013; Helliwell et al., 2014; Reeskens & Vandecasteele, 2016). Furthermore, our results converge with the findings of Oishi et al. (2011), who found that the decrease of inter-personal trust in lower income classes is associated also with lower life satisfaction.

Our results are in contrast with the analysis by Habibov & Afandi (2015), who found that during an economic crisis, institutional trust decreased but interpersonal trust increased. Our study shows that both of these decreased. Moreover, we add sub-group specific detail to this thesis as we find that this decrease is most drastic in the lower socio-economic strata, whereas the tertiary-educated showed an increase in both interpersonal and institutional trust during crisis.

The results from 2010 on the role of income merit further discussion. In the final model, belonging to the lowest income quartile still had a significant negative impact on life satisfaction. This is in marked contrast to 2008, where the income stratification of life satisfaction was completely due to subjective economic hardship. This means that certain important omitted variables and mechanism are at play. These may include the effects of relative and rank income (Boyce et al., 2010), for which we had no empirical measures. Future studies might be able to elucidate this topic.

Finally, our study is subject to some limitations that could be considered as paths for future studies. First, as it applies a repeated cross-sectional data analysis it cannot disentangle the precise causal mechanisms affecting life satisfaction. Also, future studies could elaborate on the policy dimensions related to the stratification of SWB. This study did not address the question of how much of the effects documented in Ireland were due to specific policy implications embedded in the so-called “austerity measures”. A study focusing on this question could be constructed as a comparison between countries that have applied different socio-political and economic reforms tackling the economic crisis.

Another perspective that future studies could examine is the stratification of other forms of SWB than evaluative life satisfaction. An interesting option would be to focus on a so-called “flourishing” account within SWB, emphasizing the active functioning of an individual instead of simply an evaluative and reflective life satisfaction account (Huppert and So, 2013; Ryan & Deci, 2001). As these “flourishing” measures are considered to be less sensitive to social comparison than life satisfaction, their analysis could shed further light on the stratification of SWB.

Notes

¹ The threefold structure of SWB or happiness research is thoroughly described for example in OECD (2013b), and Kristjansson (2010). Each of the different accounts (*hedonistic, life satisfaction, and eudaimonistic*) in SWB studies have their own philosophical foundations and related measures (Kristjansson, 2010. p. 301).

² We thank one of the anonymous the reviewers of this paper for this formulation regarding the motivation for the study, and the editor of this journal for very useful comments and suggestions at the final stages of revising this manuscript.

³ This may suggest that farming is not easily positioned within the hierarchy of modern labour markets but it could be also linked to the finding that individuals in countryside report systemically higher life satisfaction than those dwelling in large urban centers (e.g.

Sørensen, 2014). Furthermore, farms may operate as a safe haven in times of economic turmoil. All in all, the relatively higher life satisfaction of farmers provides an interesting detail and should be further studied. This applies to analyses studying the socio-economic stratification of subjective wellbeing but also to studies interested in its geographical variance.

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