A multilevel measurement model of social cohesion

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ABSTRACT

In spite of its currency both in academic research and political rhetoric, there are numerous attempts to define and conceptualize the social cohesion concept but there has been paid little attention to provide a rigorous and empirically tested definition. There are even fewer studies that address social cohesion in a framework of cross-cultural validation of the indicators testing the equivalence of the factorial structure across countries. Finally, as far as we know there is no study that attempt to provide an empirically tested multilevel definition of social cohesion specifying a Multilevel Structural Equation Model. This study aims to cover this gap.

First, we provide a theoretical construct of social cohesion taking into account not only its multidimensionality but also its multilevel structure. In the second step, to test the validity of this theoretical construct, we perform a multilevel confirmatory factor analysis in order to verify if the conceptual structure suggested in first step holds. In addition, we test the cross-level structural equivalence and the measurement invariance of the model in order to verify if the same multilevel model of social cohesion holds across the 29 countries analysed. In the final step, we specify a second-order multilevel CFA model in order to identify the existence of a general factor that can be called "social cohesion" operating in society that accounts for the surface phenomena that we observe.

Keywords Multilevel Analysis, Multilevel SEM, Social Cohesion, construct validation, multilevel measurement invariance.

1. Introduction

In the past years, researchers have paid a lot of attention to the concept of social cohesion. However, despite widespread attention from scholars and policymakers, there are few attempts to provide a rigorous and empirically tested definition (Dickes et al 2010). It is a given that social cohesion is considered a multidimensional concept (Jenson 1998; Bernard 1999; Berger-Schmitt 2000); however there are not many empirical corroborations of this multidimensionality. Even fewer studies address social cohesion in a cross-cultural framework trying to test the equivalence of the factorial structure in different cultures. Finally, as far as we know, no study attempts to provide an empirically tested multilevel definition of social cohesion specifying a Multilevel Structural Equation Model.
This paper aims to cover this gap. More specifically, this study addresses several goals. First, we provide a theoretical multidimensional construct of social cohesion. In the second step, to test the validity of this theoretical construct, we perform several multilevel confirmatory factor analyses in order to verify if the conceptual structure suggested in first step holds. Third, we examine if the multilevel model of social cohesion is equivalent across the 29 countries taking part in the European Social Survey (wave 6, 2012). In this regard, we test the cross-level structural equivalence of social cohesion trying to provide a multilevel confirmatory factor analysis model of social cohesion in order to verify if the same latent structure holds both at individual and country level. In addition, we test the measurement invariance of the social cohesion construct to evaluate if the model remains the same across all countries (Jak et al. 2013; Davidov et al. 2012). At country level, allowing the coefficients to be random, we test a random coefficient model trying both to impose the same structure obtained at individual level and to constrain the Lambda coefficient to be equal across levels with residual variances constrained to zero. The first condition is useful to verify if the model is structurally equivalent across levels. The latter one is fundamental for testing the measurement invariance of the model. Finally, in order to figure out if the existence of a general factor – social cohesion – that sums up all the first-order dimensions is plausible, we attempt to fit a second-order multilevel CFA model.
A researcher should not ignore the multilevel structure and the influence of the context on individual behaviours now that new statistical methods (such as the merging of the multilevel analysis and the structural equation models) allow us to deal with the complexity of human behaviour.

1.1 Social cohesion: a theoretical foreword

The concept of social cohesion has been the object of increasing attention by policymakers and scholars (Friedkin 2004). The wide spread debate hinges on the questions that the social cohesion concept makes us able to answer. Precisely, how is society and its daily reproduction possible? What keeps individuals together making societies possible?
These questions trace back to the beginnings of social science. In the Durkheim's theory (1893), social cohesion deals with solidarity and integration. There are two different conceptualizations of solidarity. Mechanical solidarity works in traditional society and it is based on similarity amongst individuals, sharing values, common horizons of meaning and similar social representations. Instead, the organic solidarity is based on dissimilarity amongst individuals. In modern societies the individuals are functionally connected. Each subject carries out a different function (that is the mechanism that produces dissimilarity) making the individuals interdependent. This interconnection produces social cohesion since the individuals are dependent from each other.

According to Parsons (1949), society is made up of other interdependent sub-systems held together by shared values reproduced by socialization. Socialization is the mechanism that produces social order. It is the opposite of Durkheimian perspective where the sharing values mechanism was typical of archaic societies.
It is worth recalling that there are other schools of thought about social order and social cohesion (Jenson 1998). Classical liberalism sees the society as a summation of individuals. The general idea is that well-functioning societies are a by-product of individual behaviours. Government interventions are seen as a limitation to individual freedom and institutional interferences should be reduced to minimal. In this framework, the institutions do not play any role in fostering social order; the process is delegated to market, individual behaviours and private institutions (family and associations). In the Tocquevillian perspective associations constitute the central pillar of his theorization. The voluntary action produces two effects: an internal effect on members fostering their co-operative behaviour and an external effect on wider polity promoting social cooperation.

1.2 Different approaches to social cohesion

Even though the social cohesion concept has been developed in the nineteenth century, nowadays there is no generally accepted social cohesion definition (Friedkin 2004; Chan et al. 2006). Indeed, as several scholars underline (Berger-Schmitt 2000; Berger-Schmitt 2002; Noll 2002; Jenson 1998; Jeannotte 2003; Bernard 1999; Beauvais and Jenson 2002), social cohesion poses several conceptual and methodological issues. There is a general confusion well summarized by Jenson: “Social cohesion is an ambiguous concept because it can be used by those seeking to accomplish a variety of things. It is sometimes deployed in rightwing and populist politics by those who long for the good old days when life seemed easier, safer, and less threatening. But social cohesion can also be used by those who fear the consequences of excessively marketised visions of the future” (1998, p. 37).
According to Chan et al. (2006), there are two main approaches to social cohesion. The first one is an academic approach rooted in sociology and social psychology (Friedkin 2004). The second is developed by policymakers. Both approaches have their own limitations.
The academic approach has not developed a homogeneous social cohesion conception obstructing the evolution of social cohesion theory (Friedkin 2004). In addition, it has not provided many operationalization schemes that are useful for effectively measuring social cohesion.
The policy approach tends to identify social cohesion with the contingent political issues that governments have to deal with. Thus, the policy approach is essentially a problem-driven approach (Chan et al. 2006). The term “cohesion” has become a panacea for the numerous new social cleavages. The problem-driven orientation produces three connected issues. First, the studies around social cohesion often become limited to an endless list of social indicators without any conceptual analysis intended to identify the social cohesion constitutive dimensions. Second, because of the problem-driven orientation, every organization has developed its own concept of social cohesion. Third, the permanent confusion between factors affecting social cohesion and the constituents of social cohesion (Dickes et al. 2010, Chan et al. 2006).

1.3 Several social cohesion definitions

One of the most important attempt to conceptualize social cohesion is carried out by Jenson (1998). Jenson identifies five dimensions of social cohesion:

1. Belonging – Isolation: it refers to shared values and the presence of a collective identity.
2. Inclusion – Exclusion: it regards the equality of opportunity of citizens in an economic market.
3. Participation – Non-involvement: it concerns the political and social participation.
4. Recognition – Rejection: it refers to respect and tolerance for diversity.
5. Legitimacy – Illegitimacy: it focuses on maintenance of legitimacy of institutions.

In Jenson's conceptualization, sharing values, a collective identity and respect of differences become relevant factors in a cohesive society. According to Chan et al. (2006), at least two of Jenson's social cohesion dimensions – inclusion and recognition – are not constituents of social cohesion but promoting factors. Bernard (1999) pinpoints a gap in Jenson's formulation adding another dimension to Jenson's conceptualization – equality/inequality – as substantial aspect of economic realm.

Duhaime et al. (2004) asserts that social cohesion is composed of two dimensions: access to formal economic and governmental conditions, access to family and community-based face-to face relationships. The authors developed six sets of indicators in order to cover the two conceptual dimensions:

1. Presence of social capital: it focuses on trust and confidence in civic institutions and participation in volunteer organizations;
2. Demographic stability: it concerns people's mobility, population growth rate, subjective reasons for moving/staying in the community;
3. Social inclusion: it concerns the access to informal networks of affective, cognitive and material support;
4. Economic inclusion: it refers to employment activity and income;
5. Community quality of life: this includes satisfaction with a series of services and personal feeling of safety in the community;
6. Individual quality of life: it focuses on mental health and subjective happiness.

There are several weaknesses in Duhaime's contribution (Chan et al. 2006). If social cohesion is intended by Duhaime at al. as "access to formal economic and governmental institutions" as well as "access to family and community-based, face to face relations" (2004, p. 301) only sets number 1, 3 and 4 should appear in Duhaime's formulation (Chan et al. 2006). In addition, there is confusion between what constitutes cohesion and what affects it. Sets number 2, 4, 5 and 6 are not constituents of social cohesion but elements that can contribute to the level of social cohesion.

In the formulation provided by Berger-Schmitt (2002) and Noll (2002), social cohesion has two societal goals/dimensions. The inequality dimension "concerns the goal of promoting equal opportunities and reducing disparities and divisions within a society" (Berger-Schmitt 2002, p. 406). The social capital dimension concerns "the goal of strengthening social relations, interactions and ties and embraces all aspects which are generally considered as the social capital of a society" (Berger-Schmitt 2002, p. 406). Berger-Schmitt (2002) suggests dividing each dimension in three additional components. The inequality dimension includes the following components:

1. Regional disparities.
2. Equal opportunities.
3. Social exclusion.

The social capital dimension includes the following components:

1. Social relations and activities within primary social groups and associations.
2. Quality of social relations.
3. Quality of societal institutions.

One of the bigger weakness of Berger-Schmitt's formulation concerns the means-end approach adopted. Berger-Schmitt defines social cohesion in terms of the conditions that can positively affect social cohesion.

The cohesion can be conceptualized as a systemic property and the collection of data takes place at aggregate level. On the contrary, following a methodological individualism approach, social cohesion is considered an effect of individual attitudes and behaviours.

Rajulton et al. (2007) make use of aggregate data to measure social cohesion identifying three spheres in which social cohesion can be considered – social, economic and political – and six dimensions: recognition and belonging in the social sphere, inclusion and equality in the economic sphere, legitimacy and participation in the political sphere.

Starting from the concept of social integration, Lockwood theorises the existence of two conceptual axes (1999). The first one concerns the institutional order at macro-societal level and it is represented by continuum civic integration-civic corruption; the second one focuses on primary networks at communal level and it is represented by continuum social cohesion-social dissolution. Social cohesion refers to the primary and secondary relationships within a local community.

Considering social cohesion not at societal level but as a property of groups, Bollen and Hoyle (1990) introduce the distinction between two different perspectives of cohesion: objective and perceived. The first one refers to objective attributes of the group as a whole involving members' self-reported closeness to other members of the group. The second perspective refers to a member's perception of his own standing in the group.

In addition, Whelan and Maître (2005) introduce a significant partition. They suggest that social cohesion can be analysed at three levels of analysis: micro, meso and macro. The micro-level concerns the interpersonal trust, the strength of relationships within family/primary groups and the risk of exclusion from these networks. The meso-level refers to the strength of relationships within secondary groups, neighbourhood, working groups and different ethnic groups. The macro-level focuses on a sense of belonging to a community, respect of differences, legitimation and efficiency of institutions.

More consistent is the formulation of social cohesion proposed by Chan et al. (2006). The authors provide a measurement scheme that includes a horizontal dimension – relationships amongst individuals and groups within society – and a vertical dimension – relationships between the state and its citizens. The formulation takes into account also two "components". The subjective component refers to attitudes whereas the objective one focuses on behaviours. Hence, Chan et al. consider four dimensions and for each dimensions they suggest feasible indicators:

- Horizontal subjective: general trust with fellow citizens, willingness to cooperate, sense of belonging.
- Horizontal objective: social participation, voluntarism.
- Vertical subjective: trust in public figures, confidence in political institutions.
- Vertical objective: political participation

Dickes et al. (2010) and Dickes and Valentova (2013) proposed a definition of social cohesion based on an integration of the theory of Bernard (1999) and Chan et al. (2006). The authors show that the framework proposed by Chan et al. overlaps the Bernard conceptualization with the exception of the economic domain. Leaving out the economic dimension, Dickes et al. (2010) by means of a

confirmatory factor analysis identify four factors: institutional trust, solidarity, social-cultural participation and political participation.

1.4. Operationalization of social cohesion

Keeping in mind the aforementioned contributions on social cohesion, we proceed to operationalize the social cohesion concept. Our proposal is based on four pillars.
First, following a methodological individualism approach, our focus is on the positive ties and the interactions amongst social actors that act in a society recognising its set of rules and the legitimacy of its institutions.
Second, following Chan et al. (2006), social cohesion can be defined as a state of affairs concerning the interactions among members of a society, as characterized by a set of attitudes, norms and their behavioural manifestations that include the strength of interpersonal ties in primary and secondary social network, trust, participation and recognition of a set of rules, institutions and society as a whole.
Three, following Whelan and Maître (2005), we suggest analysing social cohesion at three levels: micro, meso and macro. The first one involves relations amongst individuals, the meso-level concerns relationships amongst individuals and groups. Finally, the macro-level takes into account relationships amongst individuals and society.
Four, following Bollen and Hoyle (2001), we suggest considering two perspectives to analyse the social cohesion at the three levels: subjective and objective. The first (subjective) perspective focuses on attitude and people's state of mind and the objective perspective takes into account the manifestations of behaviours.
In tab.1, we show the social cohesion scheme with the seven dimensions, three levels and the two perspectives.

Tab.1 – Social cohesion scheme with seven dimensions

	subjective	**objective**
Micro	Interpersonal trust Social support	Density of social relations
Meso	Openness	Participation
Macro	Institutional trust	Legitimacy of institutions

The micro-level of social cohesion includes the dimensions concerning the "interpersonal trust", "social support" and "density of social relationships". The meso-level contains the dimension regarding a sense of acceptance and openness toward foreign citizens and diversity as well as the dimension that deals with political and social participation. At the macro level, there are two strictly related dimensions: the trust in the institutions and the legitimacy of these institutions.
We left out all the aspects referring to the economic domain (income inequality, exclusion from labour market, etc.) as we consider them factors that affect social cohesion and not its constituents. In addition, we left out the cultural dimensions like belonging, sharing values, feeling part of a community because these are typical conditions of archaic societies (Durkheim 1893).
Therefore, following the literature on social cohesion, we have identified seven dimensions of social cohesion. Then, according to our social cohesion scheme, that takes into account three dimensions

(micro, meso and macro) and two perspectives (subjective and objective), we have assigned the selected items to each theoretical dimension.
In order to test the validity of theoretical construct proposed, we fulfilled a theoretically driven selection of indicators from ESS dataset wave 6 involving 29 countries (tab.2). Only the items relevant for our theoretical framework were selected. Keeping in mind the social cohesion scheme in tab.1, we operationalize social cohesion selecting 24 indicators from ESS questionnaire. Each indicator is assigned to the belonging theoretical dimension. In tab.3 we report the 24 indicators that are distinguished according to the seven social cohesion dimensions. The labels of each indicator in tab.3 correspond to the specific question in the ESS questionnaire wave 6[1]. In tab.3 we report the respective indicators used to measure each of the seven dimensions of social cohesion with several descriptive statistics.

1.5 Data and procedure

The dataset used to perform the analyses refers to European Social Survey (ESS) wave 6 (2012). The ESS is a cross-national survey conducted every two years across Europe since 2002. The survey measures attitudes, beliefs and behaviour of EU citizens. The questionnaire covers several fundamental topics and consists of two main part – a core section and a rotating section. The rules regarding the translation of the questionnaire are very stringent[2].
Data were collected in 29 countries (tab.2). There were 54,672 respondents. The sample was representative of all individuals aged 15 and over (no upper age limit) resident within private households in each country. Quota sampling was not permitted at any stage and substitution of non-responding (whether 'refusals', 'non-contacts' or 'ineligibles') was not permitted at any stage. The mean age of the respondents was 48.3 (SD = 18.5) and 54.4% were women.

Tab.2 – ESS Countries and sample size

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	54672	100

[1] The questionnaire is available at http://www.europeansocialsurvey.org/.
[2] Additional information is available at http://www.europeansocialsurvey.org/methodology/translation.html.

All the analyses were conducted in Mplus 7. Since the variables included in the model were continuous, ordinal and dichotomous the analyses were performed on covariance matrix using robust weighted least squares estimator – WLSMV – (Asparouhov and Muthén 2007; Muthén 1984). The WLSMV is a robust estimator that does not assume normal distribution of the variables. The goodness of fit of the models was assessed using the classical chi-square test and both the comparative fit index (CFI) and the root mean square error of approximation (RMSEA) (Bentler 1992; Steiger and Lind 1980). Acceptable fit of the model are gained when the RMSEA values are less than .08 and the CFI values are greater than .90 (Hu and Bentler 1999; Hox 2010). We have used also the SRMR. However, in Multilevel SEM, SRMR, differently from conventional SEM, is not a global fit index but it is computed separately for the within part and the between part of the model. Therefore, a researcher cannot assume that SRMR-W and SRMR-B perform in a manner consistent with SRMR in conventional SEM. We used SRMR just to compare the goodness of fit of the within-model and the between-model.

Tab.3 – Descriptive statistics

	Type of variable	Label[a]	Mean	S.D.	Min	Max	ICC	Skew.	Kurt.
Interpersonal trust									
Most people can be trusted or you can't be too careful	C	A3	4.92	2.489	0	10	.157	-.266	-.663
Most people try to take advantage of you, or try to be fair	C	A4	5.50	2.342	0	10	.139	-.406	-.329
Most of the time people helpful or mostly looking out for themselves	C	A5	4.86	2.385	0	10	.130	-.183	-.556
Density of social relations									
How often socially meet with friends, relatives or colleagues	O	C2	4.79	1.634	1	7	.102	-.428	-.771
How many people with whom you can discuss intimate and personal matters	O	C3	2.67	1.440	0	6	.119	.151	-.514
Take part in social activities compared to others of same age	O	C4	2.67	.970	1	5	.042	.027	-.251
Social support									
Feel people in local area help one another	C	D21	3.65	1.583	0	6	.051	-.467	-.380
Feel appreciated by people you are close to	C	D29	7.82	1.802	0	10	.054	-1.015	1.300
Receive help and support from people you are close to	C	D36	4.96	1.253	0	6	.038	-1.511	2.418
Participation									
Worked in political party or action group last 12 months	D	B12	.04	.188	0	1	.051	4.918	22.186
Worked in another organisation or association last 12 months	D	B13	.13	.338	0	1	.254	2.186	2.778
Signed petition last 12 months	D	B15	.19	.394	0	1	.215	1.564	.446
Involved in work for voluntary or charitable organisations, how often past 12 months	O	D1	1.96	1.581	1	6	.090	.584	-1.660
Openness									
Immigration bad or good for country's economy	C	B32	4.87	2.555	0	10	.073	-.112	-.551
Country's cultural life undermined or enriched by immigrants	C	B33	5.51	2.627	0	10	.127	-.301	-.556
Immigrants make country worse or better place to live	C	B34	4.94	2.420	0	10	.111	-.109	-.303
Institutional trust									
Trust in country's parliament	C	B2	3.94	2.679	0	10	.212	.102	-.923
Trust in the legal system	C	B3	4.73	2.832	0	10	.266	-.130	-.994
Trust in politicians	C	B5	3.22	2.449	0	10	.214	.286	-.851
Trust in political parties	C	B6	3.22	2.426	0	10	.207	.293	-.792
Legitimacy of institutions									
How satisfied with the national government	C	B22	3.98	2.582	0	10	.188	.048	-.911
How satisfied with the way democracy works in country	C	B23	5.16	2.574	0	10	.233	-.321	-.669
State of education in country nowadays	C	B24	5.56	2.426	0	10	.187	-.406	-.454
State of health services in country nowadays	C	B25	5.16	2.649	0	10	.264	-.258	-.835

a = the item labels refer to the corresponding questions in the ESS questionnaire wave 6; Skew = Skewness; Kurt = Kurtosis;
Type of variable: C = continuous, O = ordinal, D = dichotomous.

2. Multilevel confirmatory factor analysis

In this part of the paper, we will test the hypothesis that social cohesion is composed of seven dimensions measured by 24 indicators as previously specified.

As several researchers have suggested (Hox 2010; Muthén 1994), because of the complexity of multilevel confirmatory factor analysis (MCFA) it is better starting with a simpler model. For this reason, our first application refers to a single level confirmatory factor analysis. Trying to ascertain if the social cohesion model with seven factors as previously conceptualized holds, firstly we performed a conventional confirmatory factor analysis (CFA) not taking into account the nested structure of the data (individuals in countries). Since the variables included in the model are continuous, ordinal and dichotomous (tab.3), we used the highly-recommended robust weighted least squares estimator (WLSMV).

The CFA model is as follows: seven latent continuous factors measured by 24 dependent variables.

Based on the chi-square value ($\chi^2 = 9613.63$, d.f. 225, $p < .001$) the model should be rejected. However, several researchers (Joreskog and Sorbom 1993; MacCallum et al. 1996) have pointed out that the chi-square value is strongly affected by sample size. Such a chi-square value is totally expected taking into account the sample size (54,672 individuals). To address the problems of the chi-square test with large sample sizes, alternative fit indices have been developed. The most popular fit indices are the CFI and the RMSEA. The indices point to a good fit. The root mean square error of approximation (RMSEA) of .028 (90% C.I. .027-.028) is considerably less than the cut-off value of .06 suggested by Hu and Bentler (1999). In addition, the comparative fit index (CFI) of .96 is greater than the cut-off value of .95 that represents a good fit (Hu and Bentler 1999).

All the factor loadings are significantly different from zero ($p < .001$). The standardized factor loadings for the *Interpersonal Trust* dimension range from .701 to .771, from .415 to .651 for *Density of social relations*, .428 to .559 for *Social Support*, .424 to 885 for *Participation*, from .776 to .853 for *Openness*, from .795 to .866 for *Institutional trust* and .569 to .815 for *Legitimacy of institutions*.

However, in the presence of a nested data structure, ignoring nesting can lead to numerous problems (Hox, 2010; Snijder and Bosker 1999). With individuals clustered in second-level units (countries in this case), the observations are no longer independent. The standard errors are underestimated and the test statistics are inflated; that is, the Type I errors are much higher than the nominal value (Raudenbush and Bryk 2002). Multilevel models are the correct approach to analyse nested data structure. Multilevel analysis allows differentiating group-level and individual-level effects. The multilevel SEM (MLSEM) is a generalization of structural equation models (SEM). One of the most important classes of MLSEM application is multilevel confirmatory factor analysis (MCFA) that allows us to estimate complex measurement models (Mehta and Neale 2005). MCFA allows defining simultaneously individual-level measurement models using observed or latent level-1 indicators and cluster-level measurement models by observed or latent level-2 indicators allowing the level-1 indicator intercepts to be random (Muthén 1994; Hox 2010).

The MCFA breaks down the total sample covariance matrix into between-group and pooled within-group covariance matrices using these two matrices to analyse the factor structure at each level (Muthén 1994; Hox 2010; Cheung and Au 2005). The two-level CFA model can be written as follows (see also Muthén 1991; Muthén 1994; Mehta and Neale 2005; Preacher et al. 2010; Hox 2013; Selig *et al*. 2008):

$y_{ij} = \mu_j + \lambda_w \eta_{wij} + \varepsilon_{wij}$

$\mu_j = \mu + \lambda_b \eta_{bj} + \varepsilon_{bj}$

The first equation represents the within (individual) part of the model; the second one stands for the between (country) part of the model. The two equations are linked by the intercept μ_j of the country *j*. The country-specific intercept (μ_j) is at the same time the dependent variable at the between level of the equation. Thus, the indicator intercept of each country is a random variable at the between level

– it can vary across level-2 units. The between latent factor η_{bj} accounts for the variance of the country-specific intercepts; the remaining residual variance – after controlling for the effect of the level-2 latent factor – is contained in the level-2 error term ε_{bj}. Residuals at level-1 and level-2 are assumed to be multivariate normally distributed with zero means.

Before performing a MCFA, we examined the variability between and within each indicator. The intraclass correlation coefficient (ICC) provides both a measure of the between countries variability and the degree of the non-independence of the observations nested into countries. The ICC represents the indicator's means variation between countries divided by the total variation and can range from 0 (no between variation) to 1 (no within variation). There is no agreed cut-off value for the ICC, but most of the researchers agree that it should be greater than .05 (Hox 2010; Snijder and Bosker 1999). The ICCs for each items are shown in tab.3. Except two indicators ("Take part in social activities" and "Receive help and support"), the items show an ICC greater than the cut-off point suggested ranging from .266 (a quarter of total variance is due to countries) to .05. The ICC average value of .146 (15% of the variability is due to between variance) indicates that there is enough between countries variance to justify a multilevel approach.

We estimated three models in total. In the first multilevel CFA model (model-1), we tried to ascertain if the latent factor structure identified in the single level model also holds at the second level. Therefore, we attempted to run a model as follows: seven latent first level continuous factors, 24 first level dependent variables, seven latent country level factors and 24 second level random variables (fig.1)[3]. The estimator is WLSMV. The RMSEA of .028 and the CFI of 0.97 reveal a good fit for the model (tab.4). The standardized root mean square residual (SRMR) indicates a better fit for the level one model than the level two part of the model (SRMR within = .038, SRMR between = .075).

All level-1 factor loadings are significant for $p < .001$. At level-2, three factor loadings (D21, B12, B13) are not significant (tab.5). The not significant level-2 factor loadings are an expected result since the level-2 sample size is not so large (29 countries). The standardized level-1 factor loadings for the Interpersonal Trust dimension range from .666 to .739, from .442 to .573 for Density of social relations, .483 to .629 for Social Support, .434 to 878 for Participation, from .783 to .844 for Openness, from .705 to .859 for Institutional trust and .531 to .771 for Legitimacy of institutions (tab.5).

Tab.4 – Goodness-of-Fit Statistics

	Model 1: seven factors at level-1 and seven factors at level-2. Loadings freely estimated	Model 2: seven factors at level-1 and seven factors at level-2. Loadings constrained to be equal	Model 3: seven factors at level-1 and seven factors at level-2. Loadings constrained to be equal and residual variances constrained to zero
χ^2	19853.762	18078.354	18034.812
df	462	486	503
CFI	.970	.973	.973
RMSEA	.028	.026	.025
SRMR Within	.038	.039	.039
SRMR Between	.075	.235	.284

At level-2 the standardized factor loadings range from .928 to 1.022 for *Interpersonal Trust*, from .577 to .995 for *Density of social relations*, from .389 to .821 *Social Support*, from .547 to .940 for *Participation*, from 0.916 to .950 for *Openness*, from .950 to .992 for *Institutional trust* and from .828 to 1.002 for *Legitimacy of institutions* (tab.5). As we can see, two standardized level-2 factor loadings are greater than one. This could happen when the second level residual variances are estimated as

[3]In a MCFA the within item intercepts are allowed to be random at between-level. The within item intercepts become dependent variables at level-2.

negative. As Hox states (2010), fixing residual variances to zero at the between-level is often necessary in MCFA when sample size at level-2 is small and the true between–group variance is close to zero. Furthermore, a standardized coefficient greater than one not necessarily tell us that something went wrong (Joreskog, 1999)[4].

Taking into account the fit indices (tab.4 Model 1) and the magnitude of the factor loadings (tab.5), we can affirm that the theoretical scheme of social cohesion composed of seven dimensions can be supported. In other words, the outcomes show that the multilevel CFA model corroborates the structure of the social cohesion model proposed by the theory. In addition, we have shown that the structure with the seven dimensions of social cohesion also holds at second level. Therefore, the structure of social cohesion identified at individual level is reproduced at second level corroborating further the validity of our theoretical proposition.

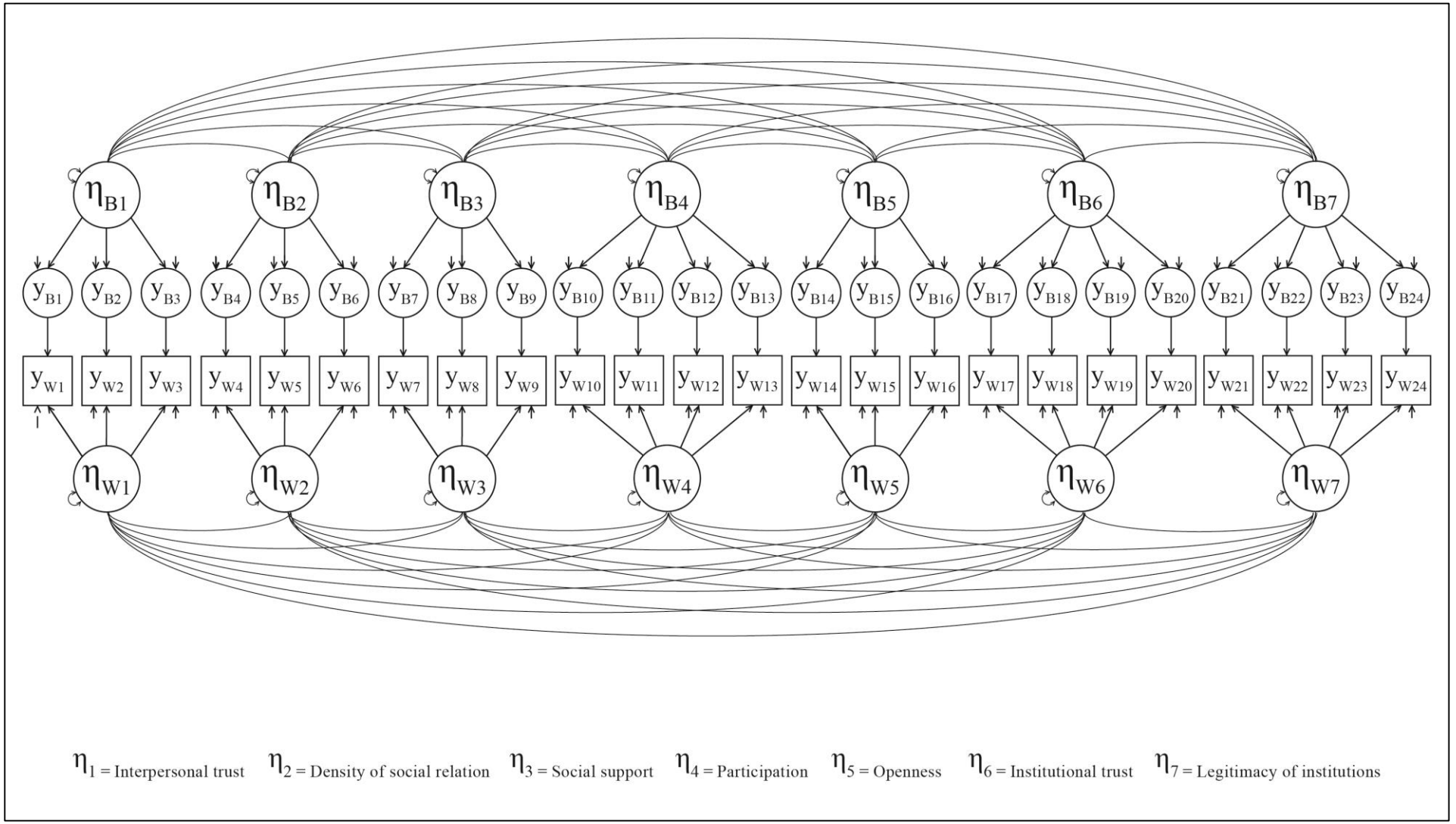
Tab.5 – Unstandardized and standardized Parameter Estimates for Model 1

	Unstandardized		Standardized	
Item	Level-1	Level-2	Level-1	Level-2
Interpersonal trust				
A3	1.00 (--------)	1.00 (--------)	0.73 (0.001)	0.94 (0.033)
A4	0.89 (0.002)	0.96 (0.109)	0.69 (0.001)	1.02 (0.025)
A5	0.87 (0.002)	0.85 (0.127)	0.66 (0.001)	0.92 (0.045)
Density of social relations				
C2	1.00 (--------)	1.00 (--------)	0.44 (0.004)	0.57 (0.111)
C3	1.13 (0.019)	1.64 (0.694)	0.57 (0.005)	0.99 (0.115)
C4	0.94 (0.024)	0.57 (0.268)	0.54 (0.009)	0.69 (0.211)
Social support				
D29	1.00 (--------)	1.00 (--------)	0.48 (0.003)	0.38 (0.143)
D21	1.14 (0.013)	1.50 (0.840)	0.62 (0.003)	0.68 (0.129)
D36	0.71 (0.007)	1.23 (0.601)	0.49 (0.003)	0.82 (0.095)
Participation				
D1	1.00 (--------)	1.00 (--------)	0.43 (0.010)	0.87 (0.227)
B12	1.18 (0.071)	0.38 (0.221)	0.61 (0.015)	0.54 (0.127)
B13	2.80 (0.544)	2.76 (1.340)	0.87 (0.042)	0.94 (0.297)
B15	1.26 (0.098)	1.48 (0.829)	0.63 (0.033)	0.90 (0.201)
Openness				
B32	1.00 (--------)	1.00 (--------)	0.78 (0.001)	0.95 (0.114)
B33	0.99 (0.001)	1.32 (0.422)	0.78 (0.001)	0.93 (0.083)
B34	0.99 (0.001)	1.12 (0.337)	0.84 (0.001)	0.91 (0.074)
Institutional trust				
B2	1.00 (--------)	1.00 (--------)	0.84 (0.000)	0.99 (0.019)
B3	0.85 (0.001)	1.15 (0.149)	0.70 (0.001)	0.96 (0.030)
B5	0.93 (0.001)	0.89 (0.165)	0.85 (0.000)	0.96 (0.037)
B6	0.88 (0.001)	0.86 (0.148)	0.82 (0.000)	0.95 (0.042)
Legitimacy of institutions				
B22	1.00 (--------)	1.00 (--------)	0.77 (0.000)	0.82 (0.094)
B23	0.95 (0.002)	1.34 (0.283)	0.76 (0.001)	1.002 (0.035)
B24	0.64 (0.002)	0.95 (0.318)	0.53 (0.001)	0.84 (0.071)
B25	0.68 (0.002)	1.24 (0.511)	0.54 (0.001)	0.85 (0.137)

Note: the first indicator of each factor is constrained to 1 to set the measurement scale of the latent factor.
In parenthesis the standard errors.

[4]A researcher should constrain to zero the residual variances close to zero, but in our first model we preferred to keep freely estimated the residual variances to evaluate the magnitude of these variances. In the model 2, we have constrained the negative residual variances to zero.

Fig.1 – Multilevel CFA social cohesion model



Since there are two levels of analysis and the hypothesis of equivalence of the factor structure across levels is sustainable, the question arises if social cohesion is measured in the same way at individual and country-level (Selig et al. 2008; Jak et al. 2013). To address the question of cross-level invariance, we estimated a second MCFA model in order to test the hypothesis of the equality of the factor loadings across levels. If the model with the factor loadings equated across levels holds, it is reasonable to conclude that the constructs are similarly measured at individual and country-level. In addition, establishing the equality of the factor loadings across levels helps to compare directly the latent variances across levels pinpointing how much variability in the latent factors is due to country or individual-level. To test the hypothesis of invariant factor loadings, we estimated the model-2. The model-2 is the same of the model-1 except for the across levels factor loadings constrained to be equal. The estimator is WLSMV.

The model-2 shows a good fit to the data[5] (RMSEA = .026 and CFI = 0.97, tab.4). The SRMR indicates a better fit of the level one model than the level two part of the model (tab.4).

The factor loadings for the constrained model 2 are all significant for $p < .001$ both at level-1 and level-2 and the standardized loadings range from .44 to .88 at individual-level and from .46 to .96 at country-level (tab.6).

Since the fit indices of model-2 point to a good fit, the hypothesis of the equal factor loadings across levels reasonably holds. If the factor loadings are invariant across levels then the metrics of level-1 and level-2 are equated allowing the direct comparability of the latent factor variances (Mehta and Neale 2005). Thus, we computed the ICCs for the seven latent factors (ICCη1= .239, ICCη2= .146, ICCη3= .052, ICCη4= .135, ICCη5= .130, ICCη6= .286 and ICCη7= .309, see fig.1): 24% of the variability in the latent factor *Interpersonal trust* is due to countries in which people are nested, in the same manner 14,6% in *Density of social relations*, 5% in *Social support*, 13,5% in *Participation*, 13% in *Openness*, 28,6% in *Institutional trust* and 31% of the variability in *Legitimacy of institutions*. Therefore, the country plays a central role exerting an important influence on individual attitudes and behaviours.

Using these ICCs with the Spearman-Brown formula, [k(ICC)]/[(k-1)(ICC)+1], where k is the average number of observations per countries, the estimated reliabilities for the factors is .99 for all seven latent factors.

In order to carry on with the evaluation of the measurement invariance of the MCFA model, we estimate the model-3 with additional constrained parameters[6]. Indeed, there are three important levels of invariance: configural, metric and scalar invariance (Meredith 1993; Cieciuch et al. 2104; Davidov et al. 2014). The lowest level of invariance – configural – points out that the same items load on the same latent factors across groups (e.g. countries, regions, classes, etc.). Configural invariance does not guarantee that the items are also measured on the same scale. Therefore, testing for metric invariance is necessary in order to compare unstandardized regression coefficients and covariances

[5]The chi-square value for model-2 decreases compared with the chi-square value for model 1 (tab.4). Generally, it should be the contrary because in model 2 we have constrained the loadings to be equal across levels gaining degree of freedom. In this case, with the WLSMV estimator, it could happen that a model with more *df* shows a lower chi-square value. This because WLSMV produces a chi-square adjusted to the means and variances, and adjustment depends not only on data but also on the models (Muthén and Muthén 1998-2012).

[6]Measurement invariance is an important issue in cross-cultural research because several problems can arise (translation problems, cultural biases, etc.). In addition, the measurement invariance of an instrument across groups is a necessary condition in order to compare groups with respect to the latent variables measured by that instrument (Jak et al. 2013).

across groups. Scalar invariance in addition requires that the item intercepts are equal across groups. This condition is necessary if a researcher want to compare latent factor means across groups.

Tab.6 – Unstandardized and standardized Parameter Estimates for Model 2 (loadings constrained equal across levels)

	Unstandardized	Standardized	
Item	Level-1 and Level-2	Level-1	Level-2
Interpersonal trust			
A3	1.00 (--------)	0.73 (0.001)	0.95 (0.062)
A4	0.89 (0.002)	0.69 (0.001)	0.96 (0.059)
A5	0.87 (0.002)	0.66 (0.001)	0.96 (0.071)
Density of social relations			
C2	1.00 (--------)	0.44 (0.004)	0.54 (0.101)
C3	1.13 (0.019)	0.57 (0.005)	0.64 (0.147)
C4	0.93 (0.025)	0.54 (0.010)	1.00 (--------)
Social support			
D29	1.00 (--------)	0.48 (0.003)	0.46 (0.120)
D21	1.14 (0.012)	0.62 (0.003)	0.62 (0.141)
D36	0.71 (0.007)	0.49 (0.003)	0.57 (0.094)
Participation			
D1	1.00 (--------)	0.44 (0.009)	0.55 (0.124)
B12	1.11 (0.062)	0.59 (0.014)	1.00 (--------)
B13	2.84 (0.544)	0.88 (0.038)	0.59 (0.130)
B15	1.28 (0.110)	0.65 (0.035)	0.49 (0.064)
Openness			
B32	1.00 (--------)	0.78 (0.001)	1.00 (--------)
B33	0.99 (0.001)	0.78 (0.001)	0.77 (0.073)
B34	0.99 (0.001)	0.84 (0.001)	0.89 (0.084)
Institutional trust			
B2	1.00 (--------)	0.84 (0.000)	1.00 (--------)
B3	0.85 (0.001)	0.70 (0.001)	0.74 (0.090)
B5	0.93 (0.001)	0.85 (0.000)	1.00 (--------)
B6	0.88 (0.001)	0.82 (0.000)	1.00 (--------)
Legitimacy of institutions			
B22	1.00 (--------)	0.77 (0.000)	1.00 (--------)
B23	0.95 (0.002)	0.76 (0.001)	0.92 (0.092)
B24	0.64 (0.002)	0.53 (0.001)	0.74 (0.114)
B25	0.68 (0.002)	0.54 (0.001)	0.60 (0.118)

Note: the first indicator of each factor is constrained to 1 to set the measurement scale of the latent factor; the others loadings at between level in the standardized solution that are equal to 1.00 is because the respective residual variances are fixed to zero. In parenthesis the standard errors.

Differently from classical methods used to test the measurement invariance (e.g. the multiple group analysis with SEM), in a multilevel CFA model it is not possible to discern between metric and scalar invariance (Jak et al. 2013). In a MCFA model, the test for the measurement invariance is carried out constraining the factor loadings to be equal across levels and fixing the residual between variances to zero.

Thus, we estimated the model-3, which is the same of the model 2 but with the residual between variances constrained to zero. The estimator is WLSMV. The fit indices indicate that the model fits the data well (RMSEA = .025 and CFI = 0.97; tab.4). The SRMR indicates a better fit of the level one model than the level two part of the model (tab.4). The level-1 and level-2 factor loadings are significant for $p < .001$ (tab.7).

Tab.7 – Unstandardized and standardized Parameter Estimates for Model 3 (loadings constrained equal across levels and between residual variances constrained to zero)

	Unstandardized	Standardized
Item	Level-1 and Level-2	Level-1
Interpersonal trust		
A3	1.00 (--------)	0.73 (0.001)
A4	0.89 (0.002)	0.69 (0.001)
A5	0.87 (0.002)	0.66 (0.001)
Density of social relations		
C2	1.00 (--------)	0.44 (0.004)
C3	1.13 (0.019)	0.57 (0.005)
C4	0.93 (0.026)	0.53 (0.010)
Social support		
D29	1.00 (--------)	0.48 (0.003)
D21	1.14 (0.012)	0.62 (0.003)
D36	0.71 (0.007)	0.49 (0.003)
Participation		
D1	1.00 (--------)	0.44 (0.010)
B12	1.09 (0.064)	0.59 (0.015)
B13	2.90 (0.578)	0.89 (0.039)
B15	1.30 (0.117)	0.65 (0.036)
Openness		
B32	1.00 (--------)	0.78 (0.001)
B33	0.99 (0.001)	0.78 (0.001)
B34	0.99 (0.001)	0.84 (0.001)
Institutional trust		
B2	1.00 (--------)	0.84 (0.000)
B3	0.85 (0.001)	0.70 (0.001)
B5	0.93 (0.001)	0.85 (0.000)
B6	0.88 (0.001)	0.82 (0.000)
Legitimacy of institutions		
B22	1.00 (--------)	0.77 (0.000)
B23	0.95 (0.002)	0.76 (0.001)
B24	0.64 (0.002)	0.53 (0.001)
B25	0.68 (0.002)	0.54 (0.001)

Note: since the residual between variances are constrained to zero, the level-2 standardized coefficients are equal to 1.00; the first indicator of each factor is constrained to 1 to set the measurement scale of the latent factor. In parenthesis the standard errors.

Since the fit indices do not change going from model-2 to model-3, the measurement invariance (both metric and scalar) seems confirmed[7]. The metric and scalar invariance means that there is no "cluster bias" (see Jak et al. 2013). In other words, the relationships between the latent factors and the indicators are the same in the 29 countries. This means that all the variability in the indicators is explained by latent factors, but also that the indicator intercepts are equal across level-2 countries.

To summarise, we have estimated three models. The models include progressively constrained parameters with the model-3 that is the most constraining model (i.e. factor loadings constrained to be equal across levels and between residual variances constrained to zero). Each of them shows that, adding progressively constrained parameters, the structure of the social cohesion scheme with seven dimension is corroborated in any case. The constrained parameters helped us to test several hypotheses as the equivalence of the structure across levels and the measurement invariance of the

[7]The model-3 is nested in model-2 that in turn is nested in model-1. In these cases, a researcher can perform the chi-square difference test. Mplus with WLSMV estimator requires a special procedure called DIFFTEST. However, we cannot perform a chi-square difference test neither inspect the modification indices searching for misfit areas because they are not still available with WLSMV estimator in Mplus 7 for multilevel data.

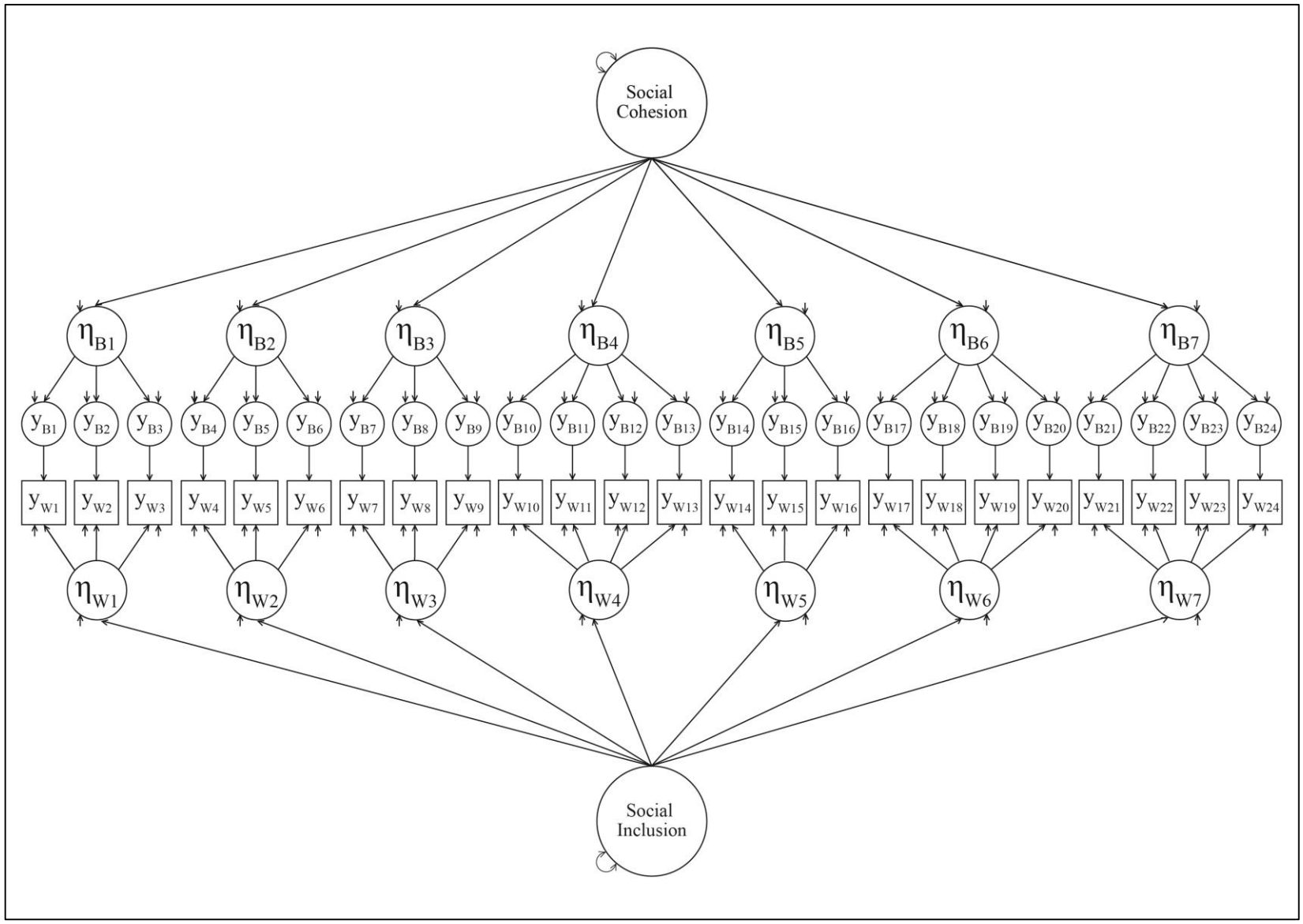
social cohesion model across countries and across levels. More importantly, although we constrained several parameters making the models more restrictive, the general structure of the social cohesion model with seven dimensions is always corroborated. This outcome represents a fundamental aspect that provides substantial support to our general model of social cohesion.
In the next section, we will test the hypothesis of the existence of a general factor capable of explaining the first-order factor structure accounting for first-order factor covariances.

2.1 Second-order multilevel confirmatory factor analysis

The reasons that can lead a researcher to perform a second-order factor analysis are threefold. More specifically, these reasons deal with theory, statistics and empirical research. Theoretically speaking, it may be of interest to examine the higher-order factor structure of the social cohesion model. The existence of a more general factor that can explain the first-order factor structure would be a good step forward in terms of simplicity and elegance. Moreover, the presence of one second-order factor capable of explaining the seven factors detected would constitute substantial evidence that a general factor that can be called "social cohesion" operating in society exists and accounts for the surface phenomena that we observe. Statistically, it is the pattern of correlations amongst factors that suggests the viability of the second-order model. In fact, if there were no relationships amongst the first-order factors, there would be no justification for estimating a higher-order factor analysis. Nevertheless, the viability of performing a second-order factor analysis should be driven exclusively by theoretical reasons. Fitting a second-order CFA model should be justified on theoretical and conceptual grounds. Only if the theory suggests the presence of a higher-order factor that can explain the covariation amongst first-order factors a researcher can specify a second-order CFA, especially because the higher-order factors are specified without any indicators.
Our conceptualization of social cohesion (tab.1) suggests that should be one factor at both level-1 and level-2 that is responsible for the covariation of the lower-order factors. Thus, to test this hypothesis we estimated a model with one second-order factor at between level and one second-order factor at within level (fig.2) [8]. The structure of the first-order model remains unchanged with the factor loadings constrained to be equal across levels and the between residual variances fixed to zero. In addition, we constrained also the second-order factor loadings to be equal across levels. The estimator is WLSMV.
Taking into account that the model is extremely complex and that we are attempting to explain the 42 covariances between the first-order factors with only one second-order factor at level-1 and one second-order factor at level-2, the fit indices point to a good fit (RMSEA = .038 and CFI = 0.949). We should keep in mind that a second-order CFA model cannot improve the goodness of fit of the first-order solution because the second-order model attempts to reproduce the covariances amongst the first-order factors, which are freely estimated in the first-order model, with a smaller number of parameters. The SRMR indicates a better fit with the level one model than the level two part of the model (SRMR within = .056, SRMR between = .246).

[8]In order to run the model we had to leave out the dichotomous variable "b13". It showed extremely huge standard error caused by computation problem.

Fig.2 – Multilevel second-order CFA social cohesion model



The first and second-order level-1 factor loadings and the first and second-order level-2 factor loadings are significant for $p < .001$ and each of the first-order latent variables load quite strongly on the second-order factor (tab.8). The standardized level-1 second-order factor loadings are .533 for *Interpersonal Trust*, .249 for *Density of social relations*, .378 for *Social Support*, .273 for *Participation*, .408 for *Openness*, .807 for *Institutional trust* and .874 for *Legitimacy of institutions* (tab.8).
Instead, the standardized level-2 second-order factor loadings are .681 for *Interpersonal Trust*, .412 for *Density of social relations*, .955 for *Social Support*, .586 for *Participation*, .764 for *Openness*, .912 for *Institutional trust* and .909 for *Legitimacy of institutions* (tab.8).
Since the fit of the model in the second-order solution does not decrease much compared to the first-order solution, we can conclude that the model with one second-order factor at both levels provides a good account for the correlations between the first-order factors. In addition, this constitutes good evidence of the existence of the more generic non-observed property, that we can call "social cohesion" at country level and "social inclusion" at individual level. These properties account for the surface phenomena that we observe and explain fundamental dimensions of human society like general trust in other people or in institutions, participation, willingness to accept diversity and density of the social and interpersonal relationships.

Tab.8 – Second-order factor loadings

	Unstandardized	Standardized	
First-order factors	Level-1 and Level-2	Level-1	Level-2
Interpersonal trust	1.000	0.533	0.681
Density of social relations	0.184	0.249	0.412
Social support	0.348	0.378	0.955
Participation	0.157	0.273	0.586
Openness	0.874	0.408	0.764
Institutional trust	1.792	0.807	0.912
Legitimacy of institutions	1.731	0.874	0.909

Given that the second-order factor loadings in the "Multilevel second-order CFA social cohesion model" are constrained to be equal across levels, we can compute the general ICC that refers to the general second-order factor. The ICC (= .347) points out that almost the 35% of the variability in the second-order latent construct is due to second levels units. Therefore, the aggregate level plays a key role in the explanation of the mechanisms generating social cohesion.

3. Discussion and conclusion

In spite of its recent currency both in academic research and political rhetoric, there are numerous attempts to define and conceptualize the social cohesion concept but there has been paid little attention to providing a rigorous and empirically tested definition (Dickes et al. 2010).
Many scholars have referred to social cohesion as a multidimensional concept (Jenson 1998, Bernard 1999, Berger-Schmitt 2000), but, once again, there are few empirical corroborations of this multidimensionality. Moreover, there are even fewer studies that address social cohesion in a framework of cross-cultural validation of the indicators testing the equivalence of the factorial structure across countries. As far as we know, there is no study that attempt to provide an empirically tested multilevel definition of social cohesion specifying a Multilevel Structural Equation Model.
We considered social cohesion a multidimensional concept composed of seven dimensions. The first three dimensions (*Interpersonal trust*, *Density of social relations*, *Social support*) deal with the social

interactions that involve individuals. The second two dimensions *Openness* and *Participation* concern, on one hand, the willingness to accept people from different countries and, on the other hand, civic engagement. The last two dimensions (*Legitimacy of institutions* and *Institutional trust*) regard the general attitude towards the functioning of society and its institutions. Concerning the measurement issue, we tried to specify a social cohesion measurement model that takes into account the nested structure of the data. We used a SEM approach because it allows us to not only measure the construct of our interest but also it takes into account the measurement error.

We estimated several CFA models. First, we specified a single level CFA model. This model has shown that the seven latent factor structure is tenable showing very good model fit indices. Having established that the model with seven factor holds, we went ahead specifying a multilevel CFA model. There are several reasons for which we used a Multilevel SEM approach. Firstly, in the ESS dataset the respondents are nested in countries and the observations are not independent. Indeed, we have seen that the average ICC of the items is 14.6%. With such a data structure, ignoring the nested nature of the data can produce biased estimates. Secondarily, it has to be taken into account that the ESS is a cross-national survey. A critical assumption in cross-cultural comparative research refers to the fact that the instrument measures the same construct in the same way across all groups (the countries in our research). The classical approach for testing measurement invariance is the multiple group analysis. However, MGCFA becomes unwieldy or even infeasible if the number of groups is large (Byrne and van De Vijver 2010). The MCFA represents a relatively new and more feasible instrument to test measurement invariance (Rabe-Hesketh et al. 2004; Muthén 1990). According to Jak et al. (2013), there is a cluster bias when something other than the construct we intend to measure is causing differences in the observed scores. Testing for cluster bias makes it possible to detect violations of measurement invariance across level-2 units. Thus, we estimated the model 3 to empirically check if the constructs are measured in the same way across countries. Lastly, multilevel structural equation modelling allowed us to decompose the total variance in between variance (cluster dependent) and within variance (individual dependent). In addition, it is possible for a researcher, having verified that there is level-2 variability, to account for this variability adding to the model level-2 covariates.

Speaking about substantive findings, after providing an operational definition of social cohesion, we tested this model and empirically showed that the social cohesion is a multidimensional concept that involves several sub-dimensions. Indeed, a one general latent factor model shows a bad fit to the data (RMSEA = .099, CFI = .437) and the model have to be rejected.

Taking into account the nested structure of the data, we tested this seven-factor social cohesion theoretical model using a multilevel CFA model. The multilevel CFA social cohesion model has shown isomorphism (for isomorphism see Adamopoulos 2008; Fontaine 2008) between the level-1 and level-2 factor structure. This means that the level-1 structure with seven factors holds also at level-2; that is, the social cohesion model is cross-level equivalent since it has the same factorial structure across levels. In this way, we have shown that social cohesion it is not only a multidimensional concept but also a multilevel concept. Through model-2, we have also seen that not only at level-1 and at level-2 social cohesion have the same factorial structure but also that these factors have the same relationship across levels with their indicators. In other word, the level-1 factors and the level-2 factors have the same interpretation (the lambda coefficients are equal across levels). In addition, in order to evaluate the measurement invariance we estimated the model-3. Since this model holds, we can conclude that the social cohesion measurement model is invariant across countries; that is, the social cohesion measurement model is the same in all the 29 countries.

Substantially speaking, specifying a model like model-3 with the between residual variances constrained to zero means that the measurement seven-factor social cohesion model presented above accounts for all variability that is in the observed variables. That means that there are not external or other factors above and beyond those identified that can affect the model.

Finally, with the estimation of the second-order multilevel CFA model we was able to show the existence of a general second-order isomorphic factors at between level (social cohesion) and at within level (social inclusion).

We can conclude that social cohesion is a concept built up on individuals' attitudes and behaviours but that it also exerts influence at aggregate level. More cohesive countries (or groups, neighbourhoods, regions) are produced when aggregate conditions produce positive membership attitudes and behaviours and, in turn, interpersonal interactions operate to maintain these positive conditions, attitudes and behaviours (Friedkin 2004). Social cohesion should be referred to at an aggregate level because it does not make sense to state the cohesiveness of an individual. At individual level, there is another mechanism at work. The "social inclusion" is the isomorphic concept of social cohesion that works at individual level accounting for individual attitudes and behaviours (e.g. levels of interpersonal trust, participation, density of social relationships). These attitudes and behaviours are also affected by macro mechanisms (social cohesion). Since the factor loadings are equated across levels, the magnitude of the effects exerted by macro and micro levels can be measured and compared. As we have seen, the macro level in the explanation of attitudes and behaviours account for 24% of the variability in the latent factor *Interpersonal trust*, 14,6% in *Density of social relations*, 5% *Social support*, 13,5% in *Participation*, 13% in *Openness*, 28,6% in *Institutional trust* and the 31% in *Legitimacy of institutions*. In addition, the 35% of the variability in the second-order latent construct is due to the aggregate level. The micro or individual portion of the total variance is larger; however, the macro effects exerted by countries remain not negligible.

Importantly, we showed that the social cohesion is a multidimensional construct of second order. This means that social cohesion does not affect directly individuals' attitudes and behaviours; rather, social cohesion is a more general concept that influences its multiple sub-dimensions, which in turn affects the individual attitude and behaviour.

In conclusion, this study has provided a multilevel social cohesion model that has shown its validity across the 29 countries revealing how the mechanisms of social cohesion work in the same way across those cultures.

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