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Discussant: Ruud Muffels (Tilburg University, The Netherlands)

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by

Paul Dickes
University of Nancy 2, France & CEPS/INSTEAD, Luxembourg

Alessio Fusco
CEPS/INSTEAD, Luxembourg & CEMAFI – University of Nice Sophia Antipolis, France

Eric Marlier
CEPS/INSTEAD, Luxembourg

For additional information please contact:

Alessio Fusco
CEPS/INSTEAD
B.P. 48, L-4501 Differdange, Luxembourg
Email: alessio.fusco@ceps.lu

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Socially perceived necessities of life across EU countries: Structures and consensus*

Paul Dickes
University of Nancy 2, France & CEPS/INSTEAD, Luxembourg
Alessio Fusco†
CEPS/INSTEAD, Luxembourg & CEMAFI – University of Nice Sophia Antipolis
Eric Marlier
CEPS/INSTEAD, Luxembourg

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Abstract: The EU Council of Ministers in 1975 defined the poor as "individuals or families whose resources are so small as to exclude them from the minimum acceptable way of life of the Member State in which they live" (Council, 1975). This widely quoted definition leaves room for discussion about what can be considered a "minimum acceptable way of life" in different countries.

The paper explores this issue by exploiting data from a Eurobarometer survey on "Poverty and exclusion", carried out in 2007 in all 27 EU Member States and aimed at assessing which items EU citizens consider to be necessary for people to live an "acceptable" or "decent" standard of living in the country where they live. This survey constitutes a major breakthrough as it is the very first dataset that allows an EU comparative investigation of socially perceived necessities of life.

The paper assesses the (in)variance of the *structure* of social needs between countries on the basis of an Individual Differences Scaling (INDSCAL) model, which is an extension of Multidimensional Scaling (MDS). It also investigates the consistency between the citizen's evaluation of necessities in different groups of countries and in the whole EU-27 population against the *social consensus* hypothesis (Mack and Lansley, 1985). The result of our analysis shows a high level of congruence between the national patterns of social needs as well as a large consistency in the identification of socially defined necessities throughout the EU. A key consequence of this is that deprivation can be measured on the basis of a same validated set of items across all 27 Member States.

***Key words*:** cluster analysis, consensus survey, deprivation, European Union, individual differences scaling (INDSCAL), multidimensional scaling (MDS), necessities of life, poverty, standard of living, well-being

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† Corresponding author: alessio.fusco@ceps.lu. Address: CEPS/INSTEAD – 44, rue Emile Mark - L-4620 Differdange – G-D of Luxembourg.

1. Introduction

Back in 1975, the European Union (EU) Council of Ministers defined the poor as "individuals or families whose resources are so small as to exclude them from the minimum acceptable way of life of the Member State in which they live" (Council, 1975). In 1984, the Council amended slightly this definition by clarifying that *poverty* is relative and is not just about financial and material resources but also about *social participation*: poor people are "persons whose resources (material, cultural and social) are so limited as to exclude them from the minimum acceptable way of life in the Member State to which they belong" (Council, 1985).

This broad definition of the "poor" encompasses two concepts that are often distinguished from each other, namely "poverty" and "deprivation". Indeed, according to Townsend (1987:140) "people can be said to be deprived if they lack the material standards of diet, clothing, housing, household facilities, working, environmental and locational conditions and facilities which are ordinarily available in their society, and do not participate in or have access to the forms of employment, occupation, education, recreation and family or social activities and relationships which are commonly experienced or accepted. If they lack or are denied resources to obtain these conditions of life and for this reason are unable to fulfil membership of society they can be said to be in poverty. The first turns on the level of conditions or activities experienced, the second on the income and other resources directly experienced."

These widely quoted definitions of "poverty" and "deprivation" have raised a lot of questions concerning their operationalisation.[1] How should we assess whether non-participation to an "acceptable way of life" is due to a lack of resources? Are income-based measures sufficient or do they need to be complemented by more direct outcome measures based on deprivation indicators and/or expenditure-based measures? What are the activities that could discriminate between poor and non-poor people? What are the living conditions and amenities whose absence can be considered to be a sign of "poverty"?

Rather than trying to respond to all these questions, the paper explores "social needs" throughout the 27 EU Member States, i.e. socially perceived necessities as expressed in a Eurobarometer survey on "Poverty and exclusion" carried out on behalf of the European Commission in early 2007.[2]

Two main questions are treated in this paper. First, is there a congruence between the national structure of socially perceived necessities across the 27 Member States of the EU? Secondly, applying the so-called *social consensus* criterion (Mack and Lansley, 1985), are the evaluations of necessities by people belonging to different groups of countries and people belonging to the whole EU-27 population consistent?

The paper is organised as follows. After a short presentation of the theoretical background (section 2), we introduce the dataset and discuss some data issues (section 3). Section 4 then presents the main results of our analysis. Finally, section 5 presents the conclusions.

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[1] Kangas and Ritakallio (1998:167) put it like this: "Intuitively, everyone knows what poverty is. Poverty is deprivation and misery. Poverty also involves moral obligations: we must try to eliminate it. But as soon as we address the practical question of what the poor are actually deprived of, our definition of poverty becomes much less unanimous. What kind of misery can be defined as poverty? What should be done to decrease poverty?".

[2] For a survey of the questions related to deprivation, see Townsend (1979), Dickes (1989), Nolan and Whelan (1996) and Fusco (2007).

2. Some theoretical background

The first step in the measurement of poverty involves the choice of a criterion of poverty along which the identification of the poor will be made. In order to operationalise the aforementioned EU definitions of poverty, we have to define what constitutes an "ordinary" (as mentioned by Townsend) or "minimum acceptable" (EU definitions) way of life in each country.

Identifying what constitutes a minimum acceptable way of life is somewhat similar to answering the long researched question of what constitutes a good life (Lelkes, 2006).[3] Numerous attempts have been made to identify human needs that often end up in endless debate (see Alkire, 2001). A good example of the different issues at stake lies in the debate surrounding the definition of a relevant list of *functionings* and *capabilities* in the context of the Sen's capability approach (Sen, 1985; Brandolini and D'Alessio, 1998). The capability approach is based on the idea that interpersonal comparisons should be based on people's functionings, i.e. their beings and doings, and people's capabilities, i.e. their opportunities to achieve these functionings. However, the guidelines provided by the capability approach to operationalise this definition and conduct the evaluative exercises are rather vague. As emphasised by Robeyns (2005:192), "the capability approach claims that interpersonal comparisons should be done by analysing people's functionings and capabilities, but it doesn't specify which capabilities matter. Should we focus on a universal list of basic capabilities? How do we know which capabilities should be on such a list? And who should decide on this?".

The same kind of debate applies to the deprivation literature when it comes to define what is a minimum standard or living. Starting from the work of Townsend (1987:126), deprivation can be seen as an insufficient standard of living with respect to a norm that can be[4]:

- objective, in the case of a lack in terms of diet, clothing or other facilities that the majority of the national population have access to (and are then customary); or
- social, that is relative to a standard of living socially defined or institutionalised.

To define an "objective" standard of living, one can opt for an external and normative approach by relying on the opinion of an expert to define the needs of individuals and to then choose a set of items that would constitute an ordinary living pattern.[5] An example of this approach is provided by Martha Nussbaum's fixed and normative list of *central human capabilities* which every person should be entitled to as a matter of justice (Nussbaum, 2000). This kind of approach is exposed to a risk of

[3] Pantazis *et al* (2006:89) quote Charles Booth (1902:33) for whom "poor may be described as living under a struggle to obtain the necessities of life and make both ends meet".

[4] See Lelkes (2006) for an interesting account of these questions. Lelkes also investigates whether basic measures of well-being are part of individuals' utility functions, i.e. "whether specific account of the 'objective good' overlaps with people's preferences". Her results show that there is an overlap in the case of basic needs, suggesting that basic desires tend to be widely shared by human beings.

[5] *External* methods are based on the judgement of experts without taking into account the opinion of the individuals. These methods are said to be external and normative because the evaluator has an external vision of the circumstances of the individuals. By contrast, *internal* methods make use of the judgement of the individuals, such as the subjective approaches, consensual approaches or participative approaches.

"ethnocentrism", i.e. experts can be wrong concerning the universality of their judgements, and of "paternalism", i.e. experts could impose their own point of view for the well-being of the others (Fleurbaey *et al*, 1997). Other options have been used to identify an ordinary standard of living attained by the majority of the national population, for instance by reference to consumption patterns of individuals as identified through household budget surveys or by reference to the frequency criterion, according to which an item is part of an ordinary living pattern if at least half of the population has (access to) it (Townsend, 1979).

In their pioneering work, Mack and Lansley (1985) proposed to follow yet another approach, referred to as the *consensual approach*. In the *Living in Britain* survey of 1983, they tried to identify a minimum acceptable way of life by reference to the views of the society as a whole. This internal approach, by taking into account the consensual judgement of individuals to define what the "social needs" are, aims at excluding as much as possible value judgements as to what constitutes an acceptable standard of living and implicitly defines poverty with respect to a minimum standard of living defined by the citizens themselves rather than to a norm.

Mack and Lansley consider an item to be a "socially perceived necessity" if 50% or more of the population consider that it is "necessary", i.e. that all adults should be able to afford it and should not have to do without.[6] By identifying these "necessities", this method provides an empirically based insight into what could be seen as relevant functionings in the Sen's capabilities approach. The list of items identified as the necessity of life was then used in a second step to identify the poor, i.e. the individuals that have to do without these socially perceived necessities because of a lack of economic resources. Poverty is defined in terms of an *enforced lack* of at least two socially perceived necessities.[7] This second step is of major importance as it allows moving from opinions to actual deprivation; it is, however, not possible to address it in the present paper as the Eurobarometer does not contain this information.

The main result found by Mack and Lansley in their 1983 survey is that, among the 35 items that were analysed, not only basic items were considered necessary but also various social activities. Interviewees took account not only of survival or subsistence criteria but also of more "qualitative" items – e.g., quality of life, celebrations of special occasions having a hobby or leisure activities (see Mack and Lansley, 1985:54). This result, with some variations, was confirmed by surveys that followed Mack and Lansley innovative approach. Items related to clothing, housing, food and social activities tended to be ranked higher whereas items related to durable goods, except some labour-savings households goods (washing machine, refrigerator), and to communication tended to be less frequently perceived as necessities.

Many contributions have followed the approach proposed by Mack and Lansley on the basis of social consensus survey. In the UK, the survey was repeated and extended in the 1990 *Breadline Britain* survey (Gordon and Pantazis, 1997) as well as

[6] Another condition put forward by Mack and Lansley for having a social consensus is that the consensus should be achieved in the various social groups, i.e. that there should be an homogeneity of preferences within countries. In this paper, we do not investigate this issue as our primary focus here is on the differences between rather than within countries.

[7] The format of the second question consists in asking individuals which items they actually have or not. When individuals do not have the item they are classified in one of the two following category: *do not have and do not want* or *do not have because cannot afford*. The rationale for that is to take into account the taste of the individuals with respect to the absence due to a lack of resources. See Halleröd (1995) for an example of use of this type of questions.

the June 1999 *ONS Omnibus survey* within the *Poverty and Social Exclusion* (PSE) survey (see Pantazis *et al*, 2006). Other empirical works include *inter alia* Van Den Bosch (1998) in Belgium, Kangas and Ritakallio (1998) in Finland, Hillyard *et al* (2003) in Northern Ireland, Halleröd (1998) in Sweden.[8] Most of the surveys analysed in these studies cover only one country. The sets of items used are then often different from one country to the next, the period when the survey took place and the methodology applied in the survey as well… so that robust comparisons between national surveys can hardly be made. As rightly emphasised by Halleröd (1998:285), "a precondition for such a comparison is that deprivation can be measured against a standard that has social relevance in each country involved in the study". Comparisons between countries are made relatively complex when the cultural and socio-economic disparities are likely to appear in the results of the consensual approach.

The Eurobarometer survey on "Poverty and exclusion" carried out in 2007 throughout the 27 EU Member States constitutes therefore a major breakthrough. It is the very first dataset that allows an EU comparative investigation of socially perceived necessities, including the way these necessities are *structured* within and between Member States. Taking advantage of this unique feature, we first focus on the (in)variance of the structure of necessities between countries. Then, we focus on the (social) consensus between the evaluation of necessities by people belonging to different groups of countries and people belonging to the whole EU-27 population.

Even though this is clearly beyond the scope of this paper, it is worth emphasising that this survey can also offer useful guidance for the development of comparative multidimensional indicators of well-being that should complement existing financial measures (income poverty…), and could also be used as a tool for identifying relevant functionings.

3. Questionnaire and data issues

3.1 Questionnaire and dataset

As previously mentioned, consensus surveys have been used in a few countries to inform a "reasoned choice" of items to be subsequently included in social surveys. The data used in this paper were collected through a Eurobarometer survey on "Poverty and exclusion" carried out between February and March 2007. The Eurobarometer provides a rich body of information on the 27 EU countries, collected from national samples of adults aged 15 years and above living in private households. It was conducted on behalf of the European Commission with a view to informing the preparation of the 2009 thematic module on Material Deprivation of EU-SILC.[9]

For identifying socially perceived necessities throughout the EU, Eurobarometer interviewees were asked a series of questions in the following way:

"In the following questions, we would like to understand better what, in your view, is necessary for people to have what can be considered as an acceptable or decent standard of living in [your country]. For a person to have a decent standard of living in [your country], please tell me how necessary do you think it is to …"

[8] It is important to note that the consensual approach has also been subject to criticisms (see for instance McKay, 2004).

[9] EU-SILC stands for Community Statistics on Income and Living Conditions (see web-site of Eurostat, the statistical office of the European Communities).

The potential answers were: “absolutely necessary, no one should have to do without”, “necessary”, “desirable but not necessary” and “not at all necessary”. When calculating mean scores, we have assigned a value to each answer category, ranging from 0 (“not at all necessary”) to 3 (“absolutely necessary”).[10]

The questionnaire is presented in Annex 1 together with a description of the main survey characteristics. It consists of six blocks of items related to material and social deprivation and covering 74 items in total. The first five blocks of items refer to the situation of the whole population (53 items) and cover 5 domains: a) financial situation; b) housing and local environment, c) housing durables and (tele-)communication, d) healthcare and other services, clothing and food, and e) social and leisure activities. The sixth block addresses specifically the situation of children (21 items) and covers most of the previously mentioned domains (leisure, food, clothing, health, social relations, housing and financial means). These blocks cover **domains** which can be seen as reflecting an implicit, crude theoretical representation of the social necessities and which we have therefore used in our analysis.

Moreover, each item aims at identifying a necessity pertaining to one of the three specific **targets** we consider here, namely: the household, the individual person and the child. The focus of the items concerning financial situation, housing and local environment as well as housing durables and (tele-)communication is on the household. Items covering healthcare and other services, clothing and food, social and leisure activities refer to individual persons and are not necessarily shared by all household members. Finally, children items are considered separately as children can have specific necessities.

3.2 Missing values, selection of items and samples

Several methodological decisions have been made concerning the treatment of missing values, the selection of items and the national samples retained for the analysis.

Only few individuals display missing values. On the 74 items, 89.4% of interviewees have no missing values and 96%, only 1. Individuals with more than 19 missing values, that is about 25% of all items, have been excluded. Other missing values have been recoded to the national modal value of each item.

[10] This wording is slightly different from that used by Mack and Lansley (1985: 52) which was: “On these cards are a number of different items which relate to our standard of living. Please would you indicate by placing in the appropriate box the living standards you feel all adults should have in Britain today. This box is for items which you think are necessary, and which all adults should be able to afford and which they should not have to do without; this box is for items which may be desirable but are not necessary.”

For the purpose of our analysis, six items have been eliminated after checking three criteria:

a) A theoretical criterion, on the basis of which we have eliminated the items not satisfactorily fitting with the specific domain covered by the block they belong to.

b) A preliminary exploratory principal component analysis applied to the 27 countries altogether, which allows assessing the communality between each item, that is the percentage of variance explained by the common factors. When the total variance explained was less than 0.40, the item was dropped.

c) Finally, internal consistency was assessed through the computation of the Cronbach alpha in order to test the homogeneity of the block of items covered by each domain. An item was considered inconsistent, and therefore dropped, if the alpha coefficient was increasing significantly when this item was withdrawn from the block of items studied.

Following these three criteria, six items were withdrawn (21, 39, 44, 45, 68 and 71; see Annex 1). This does not mean that these six items do not address important domains, but that the study of these domains would have required additional items. Tables A1a and A1b (in Annex 2) provide respectively the national percentages of "absolutely necessary" and "absolutely necessary or necessary" for each of the 68 selected items. Table A2 provides a few statistical characteristics of each item at EU-27 level.

The focus in our paper is on the comparison of individual countries and groups of countries. It is therefore important that each country, whether small or large, receives the same importance.[11] National sample sizes in the Eurobarometer are generally around 1000 except for 5 countries: Germany (around 1500), United Kingdom (1300) as well as Cyprus, Luxembourg and Malta (500 each). When allowed by the computer programmes used, these samples have first been weighted to ensure national representativeness (in terms of gender, age…); weights are those produced in the Eurobarometer database. For each country, we have then weighted each individual so as to achieve a weighted sample size of 1000. When not allowed, i.e. in the case of cluster analysis and structural analysis, (unweighted) national sample sizes have all been equalised to 1000 observations by: a) randomly duplicating an adequate number of observations for those countries where the initial sample size was less than 1000; or b) randomly deleting the relevant number of observations for countries where the initial number of observations was higher than 1000.

4. Results

The focus of the analysis presented in the paper is on the way "social needs" are *structured*. Statistical investigation is carried out on the basis of two different tools: cluster analysis and multidimensional scaling.

In Section 4.1, we apply a **cluster analysis**. This analysis is carried out on the file containing the 68 items that we have retained for the analysis (see Section 3.2). The main objective of this is to identify groups of items with similar characteristics to help interpret the multidimensional scaling solution (see below).

[11] It should be highlighted that this is different from the standard practice, in which EU-27 averages are generally computed on the basis of population weighted national results.

In Section 4.2, we apply an **Individual Differences Scaling (INDSCAL)** model, which is an extension of Multidimensional Scaling (MDS; see Annex 3) analysis, to assess the *structural congruence* between countries, i.e. the *structural differences/similarities* in social needs between the different countries.

Finally, in Section 4.3 we check the consistency between the evaluation of necessities by people belonging to different groups of countries and people belonging to the whole EU-27 population against the social consensus hypothesis (Mack and Lansley, 1985). This analysis of the *consensual congruence* puts in perspective the results of Section 4.2 by the identification of "socially perceived necessities" for each group with similar structures.

4.1. Cluster analysis of the items

To help interpret the multidimensional scaling solution described in Section 4.2., we apply a cluster analysis to the set of items. This method aims at maximising the similarity of the items into the cluster, and the dissimilarity between the clusters. Clustering has been carried out *a posteriori*, i.e. on the basis of empirical investigation rather than *a priori*, in which the assignation of items would have been made on the basis of theoretical considerations.[12]

The cluster analysis is applied to the responses of all individuals of the dataset with equal sample size (see Section 3.2). Proximities between the items are assessed by using standardised squared Euclidian distance. Cluster assignation of the items is performed with the Ward hierarchical classification algorithm. A nine-cluster solution, presented in Table A3 (Annex 2), is retained by taking into account three criteria: 1) significant increase in the error coefficient for solutions based on less than nine clusters; 2) sufficient number of items in each cluster; 3) meaningful interpretation of each cluster. The nine clusters are as follows:

Cluster 1: Financial situation, e.g. arrears, ability to face unexpected expenses, ability to save… (Cronbach alpha: 0.75; mean item score: 2.36)

Cluster 2: Local environment and general housing comfort. A first set of items is related to the physical and social qualities of the local environment of the dwelling, i.e. no pollution, no violence/crime, no noise and well maintained public amenities. In addition, this cluster also contains items related to the general housing comfort, e.g. enough space for privacy and social activities. (Cronbach alpha: 0.88; mean item score: 2.21)

Cluster 3: Basic housing comfort, e.g. items such as dwelling equipped with a bath/shower, no leaking roof, hot running water, no risk of being forced to leave. (Cronbach alpha: 0.83; mean item score: 2.60)

Cluster 4: (Tele-)communication, i.e. mobile phone, internet, computer, TV, and also car. (Cronbach alpha: 0.83; mean item score: 1.50)

Cluster 5: Housing durables, e.g. fridge, washing machine, bed and bedding, repairing electrical good or some other broken furniture. (Cronbach alpha: 0.83; mean item score: 2.41)

[12] By contrast, the previously defined "domains" and "targets" are constructed on the basis of *a priori* considerations.

Cluster 6: Adults' and children's clothing and food, e.g. warm coat, two pairs of shoes, new clothes and meals with fish/meat/chicken and fresh fruit and vegetables both for adults and children. (Cronbach alpha: 0.87; mean item score: 2.40)

Cluster 7: Adults' and children's healthcare, e.g. access, for both adults and children, to care and medicines when needed. This cluster also includes the access to pre-school education for children. (Cronbach alpha: 0.88; mean item score: 2.68)

Cluster 8: Adults' social and leisure activities, e.g. going out once a month, inviting friends, decorating home, regular leisure and sports activities. This cluster also includes one child item, strongly linked to the related adult's items (holiday with family for at least one week a year). (Cronbach alpha: 0.89; mean item score: 1.63)

Cluster 9: Children's social and leisure activities, e.g. leisure and educational equipment, inviting friends, participating in school trips or camps, safe outdoor place for children to play. (Cronbach alpha: 0.88; mean item score: 2.22)

The categories defined by these clusters can be seen as a fine-tuned version of the six "domains" previously described. The first difference concerns the "housing and local environment" domain, which is split into clusters 2 and 3. The second difference is the split of the "housing durables and (tele-)communication" domain into clusters 4 and 5. Finally, the last difference has to do with the children items, which are now spread over different clusters, with only one of these clusters containing only child specific items (cluster 9).

The internal consistency of each cluster's scale is good as indicated by the Cronbach alpha's which range between 0.75 and 0.89. As to the average of socially perceived necessities within each cluster, it varies widely: from around 1.50-1.60 ("(tele-)communication" and "social and leisure activities of the adults") to 2.60-2.70 ("healthcare (adult and children)" and "basic housing comfort").

4.2. Individual Differences Scaling (INDSCAL) and structural congruence

Similarities between the countries' structures can be quantified through an extension of Multidimensional Scaling (MDS), allowing *Individual Differences Scaling* (INDSCAL). MDS is a multivariate technique that aims at revealing the structure of a data set by plotting points in a space with few dimensions.[13] MDS is "a method that represents measurement of similarity (or dissimilarity) among pairs of objects as distances between points of a low-dimensional multidimensional space" (see Borg and Groenen, 2005, page 3).[14]

[13] MDS has already been applied to the study of deprivation by Dickes (1994).

[14] The basic idea of multidimensional scaling is often explained by a simple geographical example. Suppose that we are given a table with the distances between cities in a country and that we are asked to produce the two-dimensional map from which those distances are derived. This could be done manually by applying a trial and error process by moving points on a paper until we find the good configuration of points. MDS does this "automatically", through an iteration process. It should be noted though that two important points make this example much simpler than the usual application of MDS (Batholomew *et alii*, 2002). First, whereas in this geographical example there is no ambiguity about what is a distance between different cities, in the usual application of MDS there is some arbitrariness in the definition of distance. Second, in the geographical case, it is known that the two-dimensional space is a satisfying solution. In other cases, we do not know beforehand how many dimensions will be needed to

In the case of the analysis of the socially perceived necessities, the application of INDSCAL, also referred to as weighted MDS (Carroll and Chang, 1970), allows identifying the structure of necessities both at the country and EU levels. The EU level structure is an average structure against which we assess the congruence of national structures. INDSCAL is applied to the countries with two objectives. First, to give a structural representation of the items in a reduced, "common" space (see Section 4.2.1). Secondly, to check whether the geometric representations of the countries can be considered equivalent in structure or, put differently, whether there is *structural congruence* between the multidimensional scaling of the 27 countries taken separately and the common space (see Section 4.2.2).[15]

The first goal could have been achieved through factor analysis or principal component analysis rather than MDS. Similarities and dissimilarities between these techniques have been discussed by McCallum (1974), Davison (1985) and Shye (1988). The main advantages of MDS include the compact representation of the points, the possibility of assessing the fit of the solutions, and the richness of the interpretation of the results that can be done on the basis of the dimensions (dimensional interpretation) and/or the geometrical configuration of the points in the space (regional interpretation).

As to the second goal, we have opted for INDSCAL rather than linear structural equation modelling because it is more convenient for large sets of items with ordinal responses. INDSCAL compares differences between different countries. Adequacies' indices allow testing the hypothesis of equality of the structure in each individual country.

In our analysis, the dissimilarities between items are computed using the standardised squared Euclidian distance (as for the cluster analysis).

4.2.1. Interpretation of the common space

The choice of the INDSCAL solution is based on the value of the average stress (Kruskal formula 1). This statistics can be considered as a kind of residual not explained by the scaling procedure. The lower the average stress, the better the fit. The stress value can also be interpreted in terms of the explained variance, similarly to linear regression results. Generally, in basic MDS solutions, a stress under 0.20 is considered adequate. In the case of INDSCAL solutions, where individual differences are taken into account, higher values of stress are generally accepted. For our analysis, a two-dimension INDSCAL common space solution has been retained, with an average stress of 0.28.

The proportion of the variance explained by the INDSCAL common space solution retained is given by the "rsq" index. It is equal to 0.58, which means that the two dimensions explain 58% of the variation.[16]

A *dimensional interpretation* can be given for the first dimension of the common space. For the 68 items, the correlation between the mean of the individual answers to

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reproduce The basic MDS model and its extensions are presented and discussed in Kruskal and Wish (1978), Coxon (1982) and Borg and Groenen (2005).

[15] For this, we have used the ALSCAL SPSS procedure, with monotonic transformation.

[16] The application of a basic MDS (without taking into account individual differences) to the data leads to a Kruskal's stress of 0.16 and an rsq value of 0.88, satisfying all the usual standards.

the items and the position of the items on the first axis of the MDS solution is 0.96 ($p<0.001$) whereas the correlation between this mean and the second dimension is only 0.32 ($p<0.01$). The lower the value of an item on the first dimension, the lower the support received by this item. The regression line of the two dimensions on the mean score for each item is provided in Figure 1. This line is nearly parallel to the horizontal axis, indicating a very strong correlation. Hence, items on the right side in Figure 1 are evaluated as more necessary than items on the left side.

The regional interpretation depends on the relationship between, on the one hand, the two dimensions of the solution and, on the other hand, the 6 "domains" and the 3 "targets" (household, individual person and child) described in Section 3.1 as well as the clusters of items identified in Section 4.1 (see Table 1).

Table 1: Anova between the two INDSCAL dimensions and the domains, targets and clusters of items (item level: n=68)

Dependent variable	F	P		Eta^2
Independent variable: domain (df: 62 and 5)				
Dimension 1	10.19	0.000	***	0.45
Dimension 2	83.28.	0.000	***	0.87
Independent variable: target (df: 65 and 2)				
Dimension 1	2.37	0.101		0.07
Dimension 2	118.93	0.000	***	0.79
Independent variable : cluster (df: 59 and 8)				
Dimension 1	31.51	0.000	***	0.81
Dimension 2	62.56	0.000	***	0.90

Source for data: European Commission, Eurobarometer special n°279 , Wave 67.1
Significant: *** p<0.001; ** p<0.01; * p<0.05.
eta^2: squared intra-class correlation

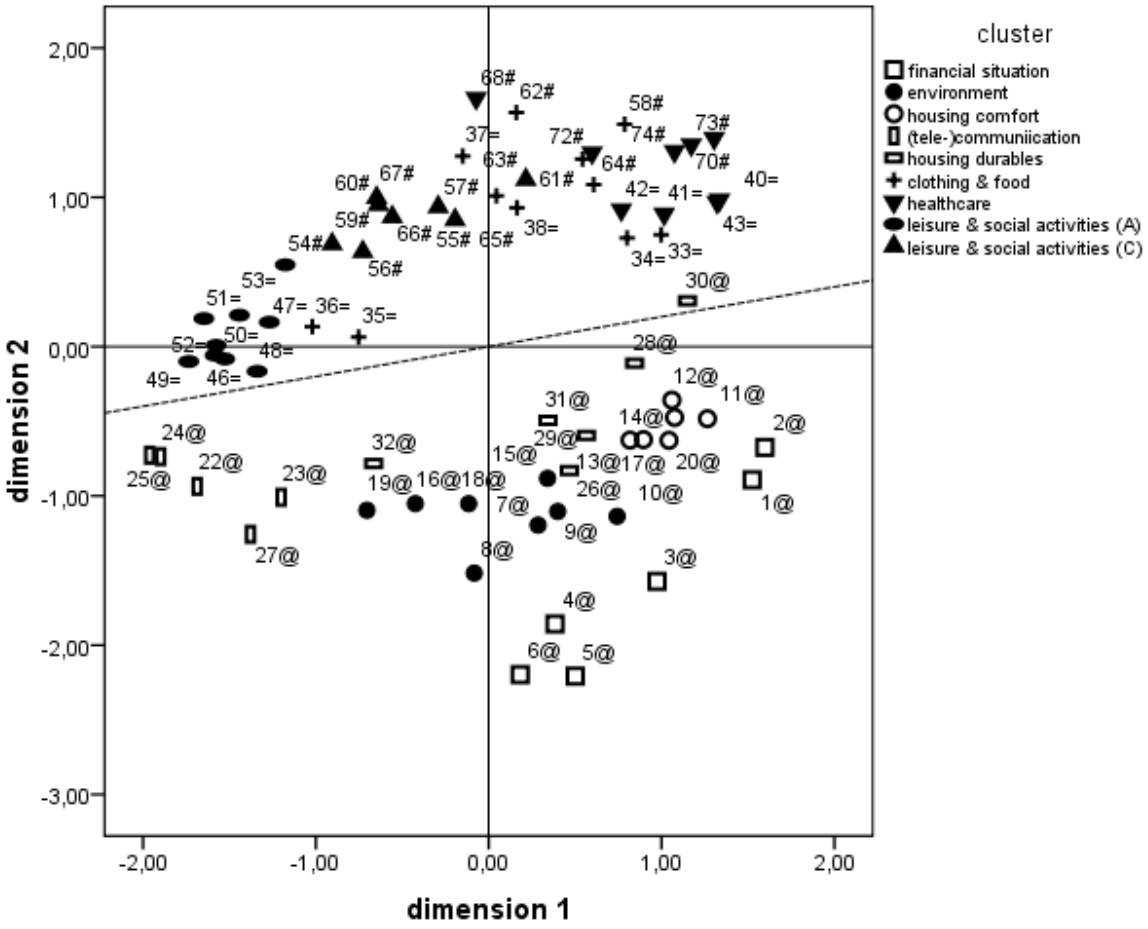
The construct "target" is substantially related to dimension 2 (it explains 79% of the variance) and not at all to dimension 1. The construct "domain" as well as the clusters of items predict very well the position of the coordinates of the items in the common space (both dimensions). The quality of the prediction of the two dimensions is higher with the clusters than with the targets and domains. Hence, the regional interpretation is mainly done against this criterion.

In the regional interpretation, we check whether the items belonging to a same cluster are located in non-overlapping regions in the MDS-space. If such non-overlapping groups of points exist, and if a meaningful interpretation can be given to these groups, then we are in a position to justify a theory concerning the measurement of socially perceived necessities. In Figures 1 and 2, items belonging to the same clusters are clearly located in distinct regions of the common space, except item 58 ("meat/chicken/fish once a day for children").

Items belonging to the following clusters are on the right side of the first dimension and gather important support: financial situation, healthcare (child and adult) and basic housing comfort. (Tele-)communication and adults' social and leisure activities items are on the left side and are thus perceived less necessary than the others. Some categories contain both necessary and non necessary items, namely

local environment and general housing comfort, clothing and food (child and adult), and children's social and leisure activities. In Figure 1, in order to highlight the relationship between "targets" and dimension 2, a symbol has been attached to each item according to the target it belongs to: household (@), individual adult (=) and child (#).

Figure 1: Common space of the two-dimension INDSCAL solution

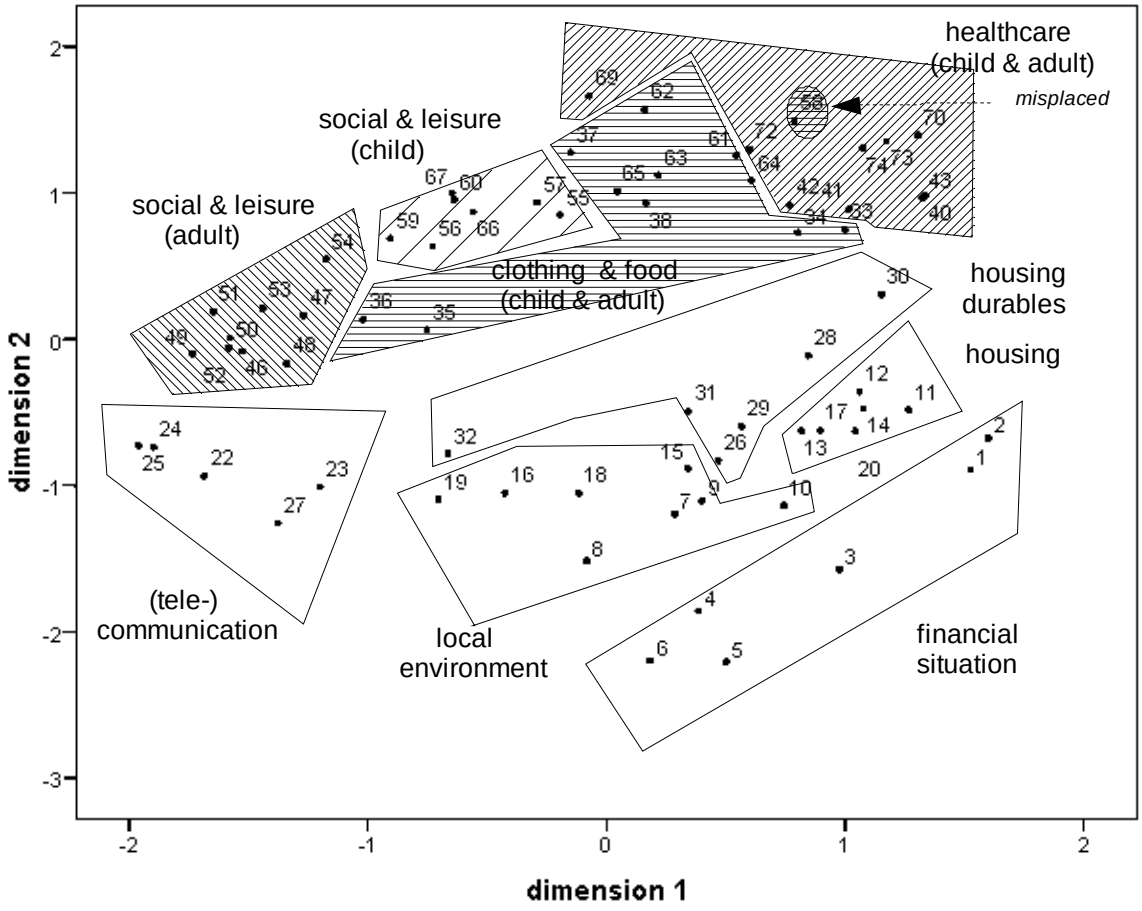


Source for data: European Commission, Eurobarometer special n°279 , Wave 67.1

Dotted line: regression line; mean= 0.37*dimension 1 +0.09*dimension 2 + 2.24 (R^2=0.96)

Note: Target categories are represented by adding to the item number a specific mark: household (@), individual adult (=) and child (#).

Figure 2: Schematic representation of the common space of the two-dimension INDSCAL solution



Source for data: European Commission, Eurobarometer special n°279 , Wave 67.1

4.2.2 Interpretation of individual spaces

Two types of information are considered to assess the structural congruence, that is to compare the structure of the individual countries against that of the average solution provided by the common space:

1) Statistical indicators provided by the INDSCAL model and by the basic MDS model applied separately to each country:

   - INDSCAL model: proportion of the variance explained by the countries (rsq; column 2 of Table 2), weirdness index (column 3) and weights of the countries on the two dimensions of the common space (Figure 3);

   - basic MDS model applied separately to each country: correlation between the mean of the individual answers to the items of the items and the first dimension for each country (column 4 of Table 2).

2) Visual examination: The adequacy of the geometric representation of each country is assessed by looking at the position of the items in each individual country two-dimensional MDS-space. In this case, we expect the items within a same cluster to be located in a same non-overlapping region (columns 5 to 13 of Table 2).

The structure of a country is considered congruent with the common space structure if both statistical indicators and visual evaluation are satisfactory. The structural congruence diagnosis is summarised in the last column of Table 2 which provides a typology of countries.

Interpretation on the basis of statistical indicators

We first assess the quality of the fit of the national structures on the basis of statistical indicators. The hypothesis that a same geometric representation is applicable to the common space and to the 27 EU countries is validated by the weights-matrix (Figure 3). The weights give the importance of each of the two dimensions for each country; they vary between 0 and 1. The similarity between the countries in the space of weights is provided by the angle formed by the vectors linking the origin to the point representing the country. If this angle is small, individual MDS structures of the countries are similar. In Figure 3, all the country points are located in a same region under the 45° line. Thus the countries depend primarily on the first dimension, which represents the support of the necessities (see above interpretation of the common space; Figure 1). The angles between the country vectors are relatively small, showing the similarity of structures between countries. Four countries have slightly different profiles (Spain, Italy, United Kingdom and Austria) but they are close enough to the other countries for not invalidating the hypothesis of structural congruence between the 27 countries.

Rsq values are mathematically derived from the coordinates of the weights. They are obtained by adding the squared weights and vary between 0.34 (CY) and 0.75 (UK); the average rsq, i.e. the rsq of the common space, is 0.58. Even though rsq is useful to show the relative importance of the explained variance for each country, it is however not able to invalidate the structural congruence hypothesis suggested above by the weights.

The weirdness index is another statistic used to assess the similarity between the common and individual structures. A country with weights proportional to the average (EU-27) weights has a weirdness of zero. Values close to 1.0 indicate that the country's weights are "weird", i.e. atypical. In our study all the values of this index are lower than 0.35, and are thus satisfactory for all the countries.

The correlations between the mean of the individual answers to the items and the first dimension of the MDS solution for each of the 27 countries suggest that the first dimension is a gradient of necessities (column 4 of Table 2) as is also the case for the common space solution (section 4.2.1).

The interpretation of the statistical indicators tends to show a good fit of the national structures against the average common space. What about the visual examination of the MDS solution for each of the 27 countries?

Table 2: Countries and structural congruence's test

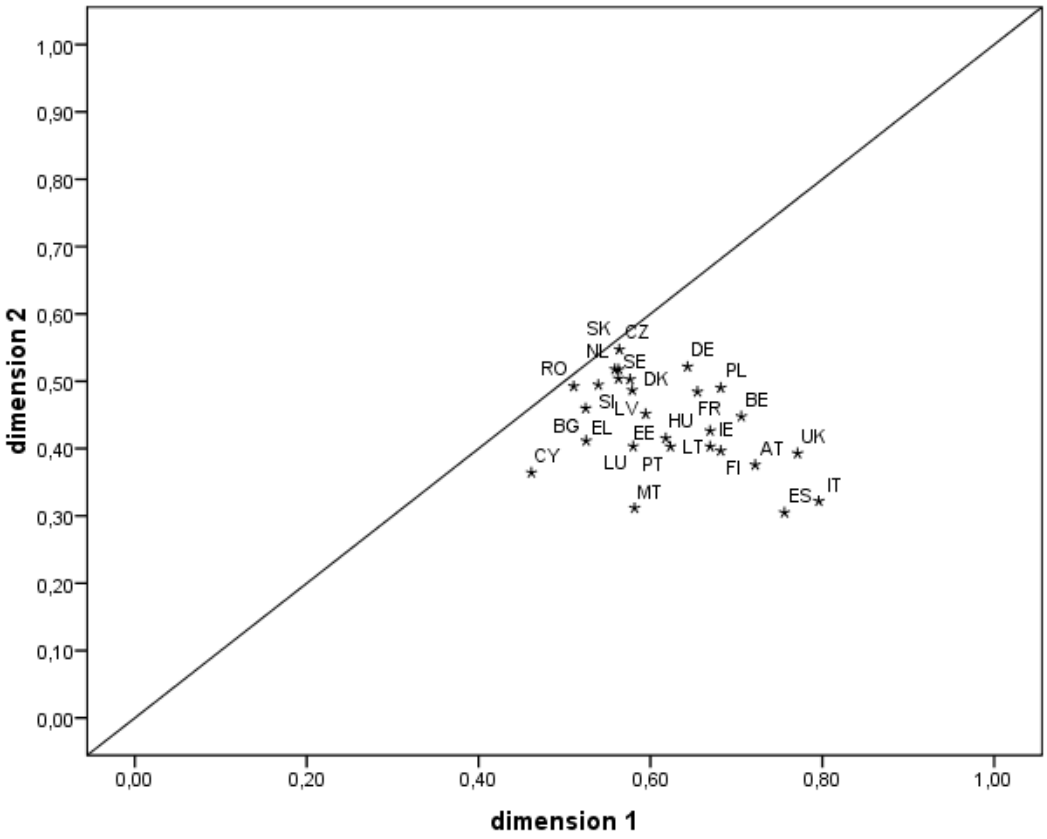
country	rsq	Weird-ness	R Mean * Dim 1	Clusters									Structure congruence
				1	2	3	4	5	6	7	8	9	
CY	0.34	0.06	0.42	1	0	1	0	1	0	0	1	2	Weak
MT	0.44	0.18	0.85	0	0	1	2	1	0	1	2	2	
EL	0.44	0.06	0.88	2	0	1	1	1	0	0	2	2	
PT	0.55	0.06	0.88	2	2	2	0	1	0	2	2	2	Sufficient
LV	0.57	0.11	0.72	2	1	1	2	0	0	2	2	2	
SK	0.58	0.16	0.92	2	2	2	2	0	0	2	2	1	
AT	0.66	0.19	0.94	0	2	2	2	1	0	1	2	2	
RO	0.50	0.19	0.86	2	2	2	1	0	2	2	1	2	Good
SI	0.53	0.16	0.93	2	2	2	2	1	0	1	2	2	
EE	0.55	0.04	0.80	2	2	1	2	1	0	1	2	2	
HU	0.55	0.03	0.91	2	2	1	1	1	0	1	2	2	
NL	0.58	0.17	0.90	2	2	2	2	1	0	2	2	2	
CZ	0.61	0.20	0.89	2	2	2	2	2	0	2	2	2	
ES	0.66	0.34	0.93	2	2	2	2	0	2	1	2	2	
IT	0.74	0.34	0.92	2	2	2	2	2	0	1	2	2	
BG	0.48	0.13	0.88	2	2	2	1	1	1	2	2	2	Strong
LU	0.50	0.01	0.94	2	2	2	2	2	1	2	2	2	
SE	0.57	0.15	0.84	2	2	2	2	1	2	1	2	1	
DK	0.58	0.14	0.88	2	2	1	2	2	1	2	2	2	
IE	0.61	0.10	0.85	2	1	2	2	1	2	1	2	2	
FI	0.62	0.13	0.88	2	2	2	2	1	2	1	2	1	
LT	0.63	0.05	0.91	1	1	2	2	1	2	2	2	2	
DE	0.65	0.09	0.93	2	2	2	2	2	1	2	2	2	
FR	0.66	0.03	0.92	2	2	2	2	2	1	2	2	1	
BE	0.69	0.07	0.93	2	2	2	2	2	2	1	2	1	
PL	0.70	0.01	0.94	2	2	2	1	2	2	2	1	2	
UK	0.75	0.23	0.95	2	2	2	2	1	2	1	2	2	

Source for data: European Commission, Eurobarometer special n°279 , Wave 67.1

Items cluster No: 0=not the same region; 1=same region except 1 or 2 items; 2=same region

Note: Countries are ranked according to the structural congruence typology, then to rsq (ascending), and finally to the weirdness index (descending)

Figure 3: Representation of the weights matrix



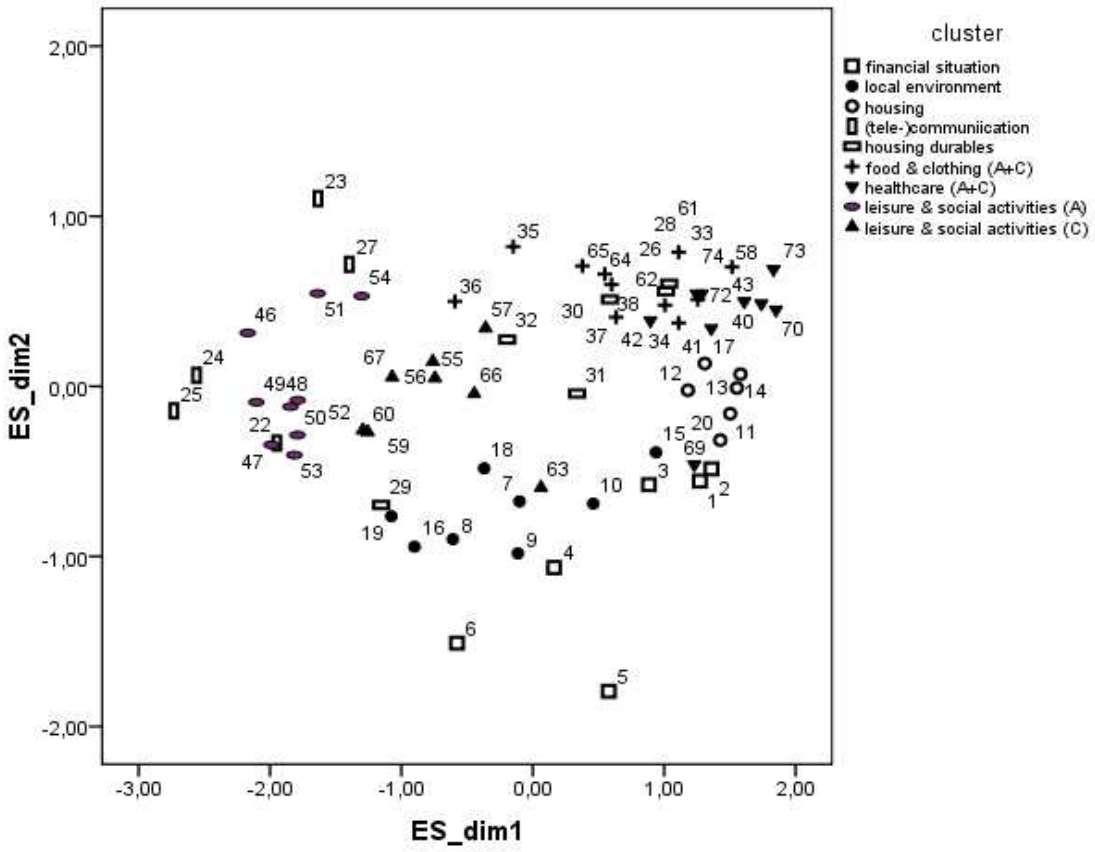
Source for data: European Commission, Eurobarometer special n°279 , Wave 67.1
Note: rsq= w_1^2+ w_2^2 with w_1 the weight for the first dimension and w_2 the weight for the second dimension

Interpretation on the basis of the visual examination

The visual examination of the MDS solution for each of the 27 countries gives enough information to assess the quality of the grouping of the items for each of the nine clusters identified (Table 2):

- Case 0 (*no region*): more than 2 items of a same cluster are not located in the same region as the other items of the cluster or are spread over various clusters. An example of this is provided by the cluster “Housing durables” in Spain (Figure 4).
- Case 1 (*same region*, *with one or two exceptions*): the grouping is still possible, except for one or two items. Again, an example is provided in Figure 2, where item 58 (“three meals a day”) is misplaced. Another example is provided by the item 69 (”access to pre-school education”) in the cluster “Healthcare” for Spain (Figure 4).
- Case 2 (*same region*): the clustering is perfect. This is typically illustrated by the common space described in Figure 2, where 8 of the 9 clusters of items are scattered together (exception: cluster “clothing and food”).

Figure 4: MDS-configuration for the Spanish sample



Source for data: European Commission, Eurobarometer special n°279 , Wave 67.1

In line with the above reasoning, a typology of **four Structural Congruence Categories** of countries can be constructed (see last column of Table 2):

- A country has a *strong structural congruence* if each of the 9 clusters of items falls under cases 1 or 2. 12 out of the 27 Member States belong to this category.
- A country has *good structural congruence,* if only one cluster falls under case 0 (8 countries).
- A country has *sufficient congruence* if two clusters fall under case 0 (4 countries).
- A country has *weak structural congruence* if more than two clusters belong to case 0. Three countries fall in this category: Malta and Greece, where only 3 out of the 9 clusters are not located in the same region as the other items of the cluster, and Cyprus, where “misplacement” of items concerns 4 clusters.

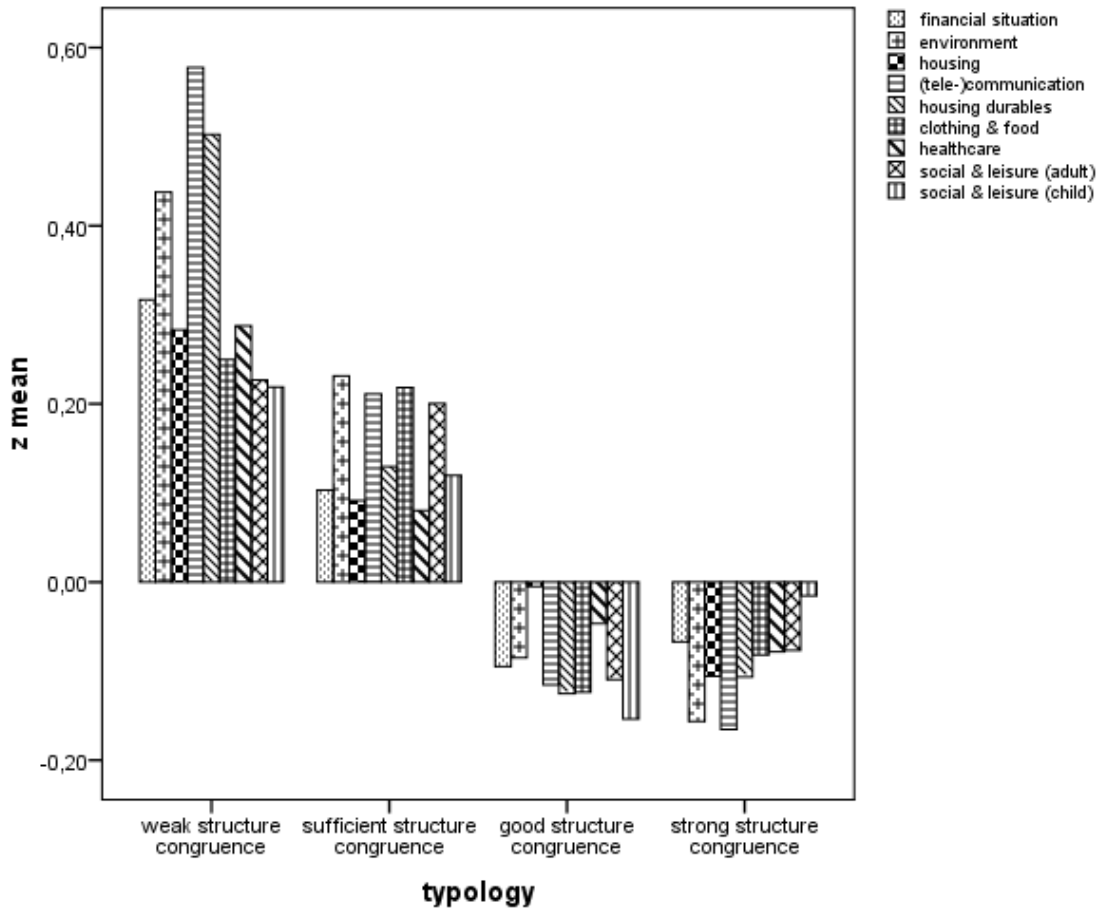
So, not less than 20 out of the 27 Member States have either a *strong* or a *good structural congruence*; only 3 have a *weak* congruence. This high consistency corroborates our analysis based on statistical indicators, which validates the hypothesis of a **structural invariance** of the perception of social needs across Member States. Two results though need to be emphasised; one is related to the columns of Table 2 (clusters) and the other has to do with the rows of this Table (Structural Congruence Categories).

As far as the clusters are concerned, “clothing and food” is by far the cluster that most frequently disturbs the strong structural congruence of social necessities at EU level, as it does not form a non-overlapping MDS region in 13 countries (for the other 8 clusters, this number varies between 0 and 4). If we carry out further analysis on the items included in this cluster, we notice that the disturbance is mainly due to the fact that this cluster gathers together children’s and adults’ items. Indeed, in 11 out of 13 countries the children’s items of this cluster form a non-overlapping MDS region.

And with regard to Structural Congruence Categories (SCCs), the variety of the countries belonging to each of these categories, except the “weak structural congruence” one, is striking. As described above, country’s included in a same SCC share the same degree of “closeness” in the perception of social needs once compared with the common space. This closeness does not seem related to socio-economic characteristics (we could not identify clear socio-economic features shared by the countries within the various SCCs). It is rather a proximity in terms of attitudes to specific social needs. The relationship between the SCCs and some of the mean of the standardised scores (one way anova, for 3 and 23 degrees of freedom) is significant between the 4 SCCs for 4 out of the 9 clusters of items: “local environment and general housing comfort” ($F=4.1$; $p=0.02$, $eta^2=0.35$), “basic housing comfort” ($F=3.0$; $p=0.05$; $eta^2=0.28$), “(tele-)communication” ($F=3.0$; $p=0.05$; $eta^2=0.28$) and “housing durables” ($F=4.6$; $p=0.01$; $eta^2=0.38$). The mean total score also differentiates the four groups ($F=3.26$; $p=0.04$; $eta^2 = 0.30$). Figure 5 illustrates this finding.

Countries with *weak* or *sufficient structural congruence* have positive mean scores and tend to perceive more items to be (absolutely) necessary across clusters (“over-reporting”); it is the opposite situation that one observes for countries with *good* or *strong structural congruence* (“under-reporting”). A better understanding of the impact and meaning of these structural (MDS) differences in terms of attitudes to social needs within the four SCCs, can be reached through the application of the *social consensus* approach (as defined by Mack and Lansley, 1985). This is what we do in Section 4.3.

Figure 5: Structural congruence typology and standardised mean score of the scales constructed from the items of the clusters



Source for data: European Commission, Eurobarometer special n°279 , Wave 67.1

Note: z means have been standardised on the basis of the mean and standard deviation of the 27 countries. Thus, a z mean of 0.5 indicates a value of +0.5 standard deviation above the overall EU-27 mean

4.3. Consensus around the evaluation of necessities across the EU

In the consensual approach put forward by Mack and Lansley (1985), an important condition for an item to be a necessity of life is that it is considered necessary by at least 50% of the population. Checking the consistency between the evaluation of necessities by people belonging to each structural congruence category (SCC) identified in Section 4.2.2 and people belonging to the whole EU-27 can help identify whether or not a consensus exists among the various groups of countries.

For assessing the level of consensus, we analyse successively:

- the “necessary” answers, i.e. those items perceived by interviewees as either “absolutely necessary, no one should have to do without” or “necessary”; and
- the “absolutely necessary” answers, i.e. those considered by interviewees “absolutely necessary, no one should have to do without”.

For each of the 68 items, the proportion of "necessary" and that of "absolutely necessary" answers are computed for the whole EU-27 population and for each of the four SCCs.[17]

Correlations give a *first general way* of assessing the level of consensus. The correlations between the proportion of "necessary" answers in the EU-27 population and in the four SCCs vary between 0.905 and 0.996 (Table 3); for the "absolutely necessary" answers, the range is identical. Spearman's rank correlations between the proportion of "necessary" and "absolutely necessary" answers are all higher than 0.9. These figures support the consensus hypothesis.[18]

Table 3: Correlations between the proportions of "necessary" (below diagonal) and "absolutely necessary" (above diagonal) answers of the 4 structural congruence categories and the total EU-27 sample (n=68)

Structural congruence category (SCC)	SCC 1 (weak)	SCC 2 (sufficient)	SCC 3 (good)	SCC 4 (strong)	Total
SCC 1 (weak)		.939	.923	.905	.938
SCC 2 (sufficient)	.942		.985	.976	.990
SCC 3 (good)	.925	.982		.988	.996
SCC 4 (strong)	.905	.974	.986		.994
Total	.930	.987	.995	.996	

Source for data: European Commission, Eurobarometer special n°279 , Wave 67.1

A more analytical way to check the consensus around the evaluation of necessities across the EU is to apply, for each item and each SCC, the test described in Table 4. The result of this test is provided in Table A4, separately for the "necessary" and "absolutely necessary" answers for each item (see also Figures A1 and A2).

[17] Throughout this Section 4.3, national samples are weighted samples but the aggregates for EU-27 and for the four structural congruence categories are a simple (unweighted) average of country's results (see Section 3.2).

[18] Spearman's rank correlations allow correcting for the non-linearity between the proportions.

Table 4: Level of consensus around the evaluation of necessities across the EU – Four possibilities

		Whole EU-27 population	
		< 50% of population consider the item a necessity of life	50+% of the population consider the item a necessity of life
Structural congruence category (SCC)	50+% of population consider the item a necessity of life	*Possibility 3: SCC preference*. A majority of people in SCC and not in EU-27 considers the item necessary (resp. absolutely necessary).	*Possibility 1: Positive consensus*. A majority of people in SCC and in EU-27 considers the item necessary (resp. absolutely necessary).
	<50% of population consider the item a necessity of life	*Possibility 2: Negative consensus*. A majority of people in SCC and in EU-27 considers the item not necessary (resp. absolutely not necessary).	*Possibility 4: EU-27 preference*. A majority of people in EU-27 and not in SCC considers the item necessary (resp. absolutely necessary).

Source for data: European Commission, Eurobarometer special n°279 , Wave 67.1

For the "necessary" answers (where, as indicated above, we consider both the "necessary" and "absolutely necessary" answers), the consensus between the SCCs and the EU-27 population is as high as 90%, i.e. 88.5% (60 out of 68 items) for the positive evaluations, plus 1.5% (1 out of 68) for the negative ones. These numbers point to a high level of consensus between SCCs and EU-27 evaluations.

If we only consider the "absolutely necessary" answers**,** the consensus between the SCCs and the EU-27 remains very high, at 75%: 37% for the positive evaluation (25/68 items) and 38% for the negative ones (26/68 items). These results are in accordance with the correlations presented in Table 3.

Table 5 summarises the results provided in Table A4 for each of the nine clusters of items.

Table 5: Summary of level of consensus around the evaluation of necessities across the EU – By clusters of items

Cluster	No. of items	Answer category	Number of items with			
			Positive consensus	Negative consensus	SCC preference	EU-27 preference
Basic housing comfort	6	Necessary	24 (6)			
		Absolutely necessary	24 (6)			
Adults' and children's healthcare	9	Necessary	36 (9)			
		Absolutely necessary	36 (9)			
Adults' and children's clothing and food	11	Necessary	44 (11)			
		Absolutely necessary	26 (5)	10 (1)	2	6
Housing durables	6	Necessary	24 (6)			
		Absolutely necessary	14 (2)	7 (1)	1	2
Children's social and leisure activities	8	Necessary	32 (8)			
		Absolutely necessary	4 (1)	27 (6)	1	
Local environment and general housing comfort	8	Necessary	32 (8)			
		Absolutely necessary	2	23 (4)	5	2
Adult's social and leisure activities	9	Necessary	23 (5)	5	7	1
		Absolutely necessary		36 (9)		
Financial situation	6	Necessary	24 (6)			
		Absolutely necessary	11 (2)	10 (1)	2	1
(Tele-) communication	5	Necessary	10 (1)	7 (1)	1	2
		Absolutely necessary		19 (4)	1	

Source for data: European Commission, Eurobarometer special n°279 , Wave 67.1

Source for classification: Tables 4 and A4; *SCC*: Structural Congruence Category (see Table 4)

Reading note: In the "Housing durables" cluster, there are *positive consensuses* between an SCC and the EU-27 as a whole on the "necessary" answers for all six cluster's items in each of the four SCCs. In the related cell, "24" refers to the number of positive consensuses (i.e. the number of "1" in Table A4) and "(6)" refers to the number of items for which there is a positive consensus between all four SCCs and the EU-27 (here, all six items included in the cluster). Similarly, if we look at the "absolutely necessary" answers given to the Housing durables items, the "7 (1)" in the *negative consensus* cell means that there are 7 cases for which there is a negative consensus between an SCC and the EU-27 (7 cells with a "2" in Table A4) and 1 item on which there is a negative consensus between each of the four SCCs and the EU-27.

On the basis of Table 5, one can identify four clusters which are characterised by a (very) strong *positive* consensus in all four Structural Congruence Categories on all or most of their items. According to the level of consensus on the clusters' items, these clusters can be split into two groups:

- "Basic housing comfort" and "Adults and children's healthcare" can be seen as **"hard core"** clusters. An overall *positive* consensus exists for both the "necessary" and "absolutely necessary" answers and for all 15 items included in these clusters. These clusters' items are clearly those which EU citizens most frequently perceive as the ones that are absolutely necessary for having a decent standard of living in the country where they live.
- Another type of strongly supported cluster is the one gathering an overall *positive* consensus for the "necessary" answers and a majority of *positive* consensus on the "absolutely necessary" answers. These clusters could be described as **"core"** clusters. "Housing durables" and "adults' and children's clothing and food" meet these conditions. For 7 of the 17 items included in these clusters, the "hard core" criterion is met – i.e., there is a double consensus (necessary/absolutely necessary) between each of the 4 SCCs and the EU-27 as a whole.

As to the remaining five clusters, they can also be classified in two groups according to their characteristics:

- Four clusters whose items are widely considered **necessary but not absolutely necessary**. These clusters can be further divided into two sub-groups:
  - "Children's social and leisure activities", "local environment and general housing comfort" and "adults' social and leisure activities": on the "necessary" answers, there is either an unanimity (for two clusters out of three) or a strong majority of *positive* consensus; and on the "absolutely necessary" answers, there is also either an unanimity (one cluster out of three) or a strong majority of *negative* consensus. Only 1 item included in these clusters meet the "hard core" criterion (it belongs to the "children's social and leisure activities").
  - "Financial situation": there is an unanimity of *positive* consensus for the "necessary" answers but there is no clear pattern for the "absolutely necessary" answer. 2 of the 6 items included in this cluster meet the "hard core" criterion.
- Finally, for the "(tele-)communication" cluster there is a very strong majority of *negative* consensus for the "absolutely necessary" answers but no clear pattern for the "necessary" answers. Opinions on these items are quite **"split"** throughout the Union.

So, for 7 out of the 9 clusters of items, the consistency between the evaluation of necessities by people belonging to each SCC identified in Section 4.2.2 and people belonging to the whole EU-27 is strong - a high degree of consensus (sometimes a "negative" consensus) exists among the various SCCs for both the "necessary" and "absolutely necessary" answers. For the remaining 2 clusters, a consensus is also met but either on the "necessary" or on the "absolutely necessary" answers only. Even the *weak SCC* meets the conditions of the social consensus test.

5. Conclusions

In our paper, we have firstly assessed the (in)variance of the *structure* of social needs between countries on the basis of an extension of Multidimensional Scaling (INDSCAL) applied to a Eurobarometer survey on "Poverty and exclusion" conducted in 2007 on behalf of the European Commission in the 27 Member States of the European Union (EU). Then, we have investigated the consistency between the EU citizen's **perception** of necessities in different groups of countries and in the whole EU population against the *social consensus* hypothesis (Mack and Lansley, 1985).

The result of our analysis shows a high level of structural congruence between the national patterns of social needs (with some qualification due to a few clusters) as well as a large consensus in the identification of socially defined necessities throughout the EU. A direct consequence of this consistency between these two complementary approaches is that it legitimates the use of a same set of items to measure deprivation in the 27 EU countries.

A thematic module on Material Deprivation will be included in the 2009 wave of the Community Statistics on Income and Living Conditions (see above). The EU-SILC module was elaborated *inter alia* on the basis of an exploratory analysis of this 2007 Eurobarometer conducted by an EU Task-Force; it will include the same set of items in all the Member States.

As pointed by Marlier *et al* (2007), it is important for deprivation items that they accurately capture living patterns and expectations of the society; therefore, they need to be checked regularly to reflect possible societal changes (e.g. every 5 years). If in this spirit a similar pan-European survey were to be repeated, findings presented in our paper could usefully be taken into account when drafting the questionnaire. For instance:

- In the 2007 Eurobarometer, the items related to the household "target" (see Section 3.1) are well represented in the structure of social needs as highlighted in the MDS/INDSCAL analysis.
- The subdivision between children's and adults' items is less clear, except for the "social and leisure activities":
    - Some clusters "satisfactorily" combine children's and adult's items (e.g. healthcare); this means that the current items are not specific to children or adults but apply to both. If it is felt important in the future set of items to cover more specifically the situation of children, then different items ought to be considered.
    - One cluster ("clothing and food") also combines children's and adult's items but not satisfactorily as it does not form a non-overlapping MDS region in 13 out of the 27 EU countries. Here also, though for different reasons than for instance "healthcare", the items of this cluster would need to be revisited for properly capturing the situation of children and/or adults.
- We have discussed only a small part of the detailed information on the level of consensus around the evaluation of necessities gathered by each of the 68 individual items selected for the analysis (Table A4 in Annex), as this would have been beyond the focus of our paper. However, this information could provide useful guidance for the preparation of the possible next questionnaire.

- When selecting the items for our analysis, initial tests lead us to the conclusion that 6 out of the 74 Eurobarometer items should better be withdrawn (see Section 3.2). These items that had to be dropped include important areas such as access to local public transport or basic banking services. If a new survey is carried out, it may be useful to reconsider how to address those domains.

Not linked to our analysis *per se*, a last important aspect that ought to be controlled if a survey similar to the 2007 Eurobarometer is repeated is the *sequence effect*. In the 2007 Eurobarometer questionnaire, items belonging to a given domain were presented together, in a same block to respondents. The very high correlation observed between the answers to the items belonging to a same block may be partially due to a sequence effect. To avoid this and thus to collect more robust data, the items retained for the future questionnaire should be presented randomly to respondents and should also be reshuffled before each interview.

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Annex 1: Short Presentation of the Survey and Questionnaire

Annex 1: Short Presentation of the Survey and Questionnaire[1]

1. Short presentation of the survey

The special Eurobarometer (EB n°279) survey analysed in this paper was carried out on behalf of the European Commission in all 27 EU Member States as well as Croatia. The fieldwork took place between 14 February and 18 March 2007 and was the responsibility of the TNS Opinion & Social consortium (see TNS, 2007).

This survey was part of wave 67.1 of the Eurobarometer. For each country surveyed, it covers the population of the respective nationalities of the European Member States aged 15 years and over who resides in the country. The basic sample design applied in all countries is a multi-stage, random (probability) one. In each country a number of sampling points were drawn with a probability proportional to the population size (for a total coverage of the country) and the population density.

In order to do so, the sampling points were drawn systematically from each of the "administrative regional units", after stratification by individual unit and type of area. They thus represent the whole territory of the countries surveyed according to the Eurostat NUTS II (or equivalent) and according to the distribution of the resident population of the respective nationalities in terms of metropolitan, urban and rural areas. In each of the selected sampling points, a starting address was drawn, at random. Further addresses (every nth address) were selected by standard "random route" procedures, from the initial address. In each household, the respondent was drawn, at random (following the "closest birthday rule"). All interviews were conducted face-to-face in people's homes and in the appropriate national language. As far as the data capture is concerned, CAPI (Computer Assisted Personal Interview) was used in those countries where this technique was available.

2. Questionnaire

Block 1: Financial situation

Question 10: *In the following questions, we would like to understand better what, in your view, is necessary for people to have what can be considered as an acceptable or decent standard of living in [your country]. For a person to have a decent standard of living in [your country], please tell me how necessary do you think it is to …*

1	qb10_1	be able to pay rent or mortgage payments on time
2	qb10_2	be able to pay utility bills (electricity, water, gas, etc.) on time
3	qb10_3	be able to repay loans on time
4	qb10_4	be able to cope with an unexpected expense
5	qb10_5	be able to save each month
6	qb10_6	afford to no longer live with one's parents after the age of 30 years

[1] Items discarded for analysis appear in bold and italics.

Block 2: Housing and local environment

Question 11: *For a person to have a decent standard of living in [your country], how necessary do you think it is to benefit from the following housing conditions?*

7	qb11_1	A place to live that is not too dark, with enough natural light
8	qb11_2	A place to live without too much noise from neighbours or the street
9	qb11_3	A place to live without too much pollution or environmental problems
10	qb11_4	A place to live without crime, violence or vandalism in the area
11	qb11_5	A place to live without a leaking roof, damp walls/floors/foundation
12	qb11_6	To be able to keep one's home adequately warm
13	qb11_7	A place to live with its own bath or shower
14	qb11_8	An indoor flushing toilet for sole use of the household
15	qb11_9	A place to live that is well maintained and kept in a decent state of repair
16	qb11_10	A place to live with enough space and privacy to read or write, or listen to music
17	qb11_11	A place to live with hot running water
18	qb11_12	A place to live with well maintained public amenities
19	qb11_13	A place to live with enough space to invite friends/family for drink/meal at home
20	qb11_14	A place to live where one doesn't risk being forced to leave

Block 3: Housing durables and (tele-)communication

Question 12: *For a person to have a decent standard of living in [your country], how necessary do you think it is to be able to afford the following if one wants to?*

21	*qb12_1*	***A fixed telephone/landline***
22	qb12_2	A mobile phone
23	qb12_3	A colour TV
24	qb12_4	A computer
25	qb12_5	An internet connection
26	qb12_6	A washing machine
27	qb12_7	A car
28	qb12_8	A refrigerator
29	qb12_9	A cooker big enough for the family
30	qb12_10	A bed and bedding for everyone in the household
31	qb12_11	Repairing or replacing major electrical goods such as the refrigerator
32	qb12_12	Replacing worn out or broken furniture

Block 4: Healthcare and other services, clothing and food

Question 13: *For a person to have a decent standard of living in [your country], how necessary do you think it is to be able to afford the following?*

33	qb13_1	A warm coat for the winter
34	qb13_2	Two pairs of shoes suited to the climate
35	qb13_3	Some new, not second hand, clothes
36	qb13_4	Smart clothes for job interviews or other formal occasions
37	qb13_5	A meal with meat, chicken or fish at least once every 2nd days
38	qb13_6	Fresh fruit and vegetables once a day
39	*qb13_7*	***Going to the hairdresser regularly***
40	qb13_8	Buying medicine when needed
41	qb13_9	Buying medical equipment (glasses, false teeth, etc.) when needed
42	qb13_10	Regular medical and dental check-ups
43	qb13_11	Medical care when needed
44	*qb13_12*	***Being able to get basic banking services***
45	*qb13_13*	***Access to local public transport***

Block 5: Social and leisure activities

Question 14: *For a person to have a decent standard of living in [your country], how necessary do you think it is to be able to afford the following if one wants to?*

46	qb14_1	Paying for one week annual holiday away from home
47	qb14_2	Buying presents for family/friends at least once a year
48	qb14_3	Being able to decorate one's home
49	qb14_4	Going out once a month (restaurant, cinema, disco or concert, etc.)
50	qb14_5	Inviting friends or family for dinner at home once a month
51	qb14_6	Participating in a regular leisure or sports activity
52	qb14_7	Spending a small amount of money each week on oneself
53	Qb14_8	Buying newspapers, magazines and books

Block 6: Child

Question 15: *Now I would like to turn to the situation of children. In the question below we have listed a number of items specifically related to children. We would like to know how important they are, in your view, for a child to be able to live and develop well. In [your country], to be able to live and develop in good conditions, how necessary do you think it is for a child to be able to enjoy the following?*

54	qb15a_1	A holiday with his/her family away from home for at least one week a year
55	qb15a_2	Enough space and privacy to study or do homework at home
56	qb15a_3	Leisure equipment (bicycle or sport equipment)
57	qb15a_4	Educational games and children's book at home
58	qb15a_5	Three meals a day
59	qb15a_6	Being able to invite their friends home
60	qb15a_7	Celebrations of special occasions (birthday, christmas)
61	qb15a_8	Eat fresh fruit and vegetables once a day
62	qb15a_9	Eat a meal with meat, chicken or fish at least once a day
63	qb15a_10	An outdoor space where they can play safely
64	qb15a_11	New and properly fitting shoes
65	qb15a_12	Some new and properly fitting clothes
66	qb15a_13	Participating in a regular leisure activity
67	qb15a_14	Participating in school trips or children's camps
68	*qb15a_15*	***Having an adult looking after her/him most of the time while at home***
69	qb15b_1	Having access to pre-school education before primary school
70	qb15b_2	Medical care when needed
71	*qb15b_3*	***Having some regular pocket money***
72	qb15b_4	Being able to meet all the necessary expenses related to his/her education
73	qb15b_5	Getting medicine and vitamins when needed
74	qb15b_6	Going for regular medical check-ups

Annex 2: Tables and Figures

Table A1a: Proportion of individuals considering the items absolutely necessary – National results and EU-27 averages

Items	EU27	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SI	SK	UK
rent/mortgage	65	75	68	59	79	59	62	59	69	82	56	65	59	70	63	63	50	65	64	59	60	59	75	77	81	58	57	62
utility bills	70	81	68	75	83	67	74	63	68	85	60	68	65	72	60	64	56	70	71	67	61	66	80	79	77	70	73	61
repay loans	53	58	55	54	75	47	39	42	61	73	50	56	50	65	50	53	42	47	60	40	25	49	57	68	62	54	42	43
unexpected expense	35	30	32	49	59	21	27	19	42	65	31	19	24	44	38	38	34	27	41	42	16	36	46	48	16	30	45	25
save each month	42	32	49	46	54	46	45	30	45	57	38	32	40	57	41	34	44	38	39	40	35	49	44	45	31	44	54	30
leave parents before 30	44	40	40	47	66	26	42	63	46	47	29	63	55	50	46	33	36	36	45	27	21	37	44	62	71	38	50	39
not too dark	43	55	32	56	57	34	36	21	47	77	31	30	29	61	53	39	33	38	45	48	27	43	61	55	28	46	51	37
no noise	32	36	21	41	51	20	19	15	40	59	25	22	23	41	47	27	30	23	40	39	18	33	48	46	15	25	37	34
no pollution	47	46	47	51	68	34	39	38	59	71	33	44	36	61	54	40	39	35	51	58	39	41	54	54	37	42	52	46
no crime	53	51	52	53	70	32	44	37	61	75	44	50	48	68	63	46	47	42	61	66	44	45	61	61	41	43	58	57
no leaking roof, damp walls/floors	69	75	69	74	74	64	75	61	78	81	56	75	69	55	68	62	56	68	71	68	62	66	69	77	78	76	70	72
keep home adequately warm	63	81	61	64	70	51	68	55	64	83	53	69	64	78	63	58	45	70	69	39	54	62	59	58	55	75	59	64
bath/shower	64	75	57	59	90	65	59	35	58	87	61	50	63	72	65	66	42	73	59	66	49	61	71	67	53	80	67	69
indoor flushing toilet	69	78	67	59	90	70	69	48	67	87	64	59	71	75	70	69	42	78	62	73	69	66	74	66	60	82	70	76
well maintained place	44	52	38	51	51	35	35	30	46	69	49	34	42	59	52	41	35	40	49	48	22	43	47	58	27	41	49	44
space to read/write, etc.	35	34	25	46	44	26	24	19	51	55	25	26	32	46	46	24	32	31	46	36	18	42	42	49	16	40	36	32
hot running water	66	80	62	51	82	64	66	50	52	86	59	60	74	73	63	64	41	72	55	62	59	62	74	74	65	81	69	71
well maintained public amenities	37	36	27	45	47	28	22	18	43	58	31	26	29	53	49	35	35	28	48	39	26	37	48	54	19	30	40	41
space to invite friends/family	27	27	20	36	39	17	21	15	31	40	22	20	21	40	42	22	28	24	35	20	15	31	37	41	14	29	29	26
no risk being forced to leave	59	63	55	67	69	50	48	38	75	71	61	63	61	74	63	57	44	63	61	55	40	60	61	79	42	62	55	59
mobile phone	19	12	8	35	41	20	5	10	33	26	10	20	6	21	17	10	22	20	38	32	4	16	22	35	9	14	26	7
colour TV	26	14	10	62	55	23	17	11	28	45	9	16	9	48	16	11	34	19	36	35	5	31	35	54	14	24	34	13
computer	12	7	6	22	18	9	5	10	19	10	5	8	5	12	9	8	13	11	20	20	6	14	13	26	8	11	17	6
internet connection	10	6	6	19	12	7	4	9	19	8	4	8	5	10	8	6	11	11	19	18	5	13	11	20	9	8	13	5
washing machine	54	60	38	68	85	59	55	22	52	75	51	46	41	67	45	39	39	71	48	75	33	56	66	57	37	77	69	34
car	23	10	14	32	84	13	10	7	21	50	16	13	30	13	23	18	19	32	20	42	4	15	29	26	19	31	24	9
refrigerator	64	72	50	76	89	62	64	54	61	87	58	61	55	69	54	48	50	76	60	84	35	62	78	71	70	77	72	43
cooker big enough	52	58	36	76	64	48	54	43	46	82	18	34	37	58	53	17	52	71	46	75	29	39	75	70	66	71	53	41
bed and bedding	71	68	65	81	85	72	75	64	75	85	53	69	68	80	62	64	56	81	70	83	57	66	79	71	78	71	74	66
repairing electrical goods	44	44	40	60	49	42	35	30	37	65	43	39	48	60	47	34	34	64	45	56	27	35	54	39	31	50	43	34
replacing worn out furniture	25	19	15	44	40	17	16	10	19	57	27	12	18	31	33	17	23	28	37	15	10	23	40	34	13	24	26	18

Source for data: European Commission, Eurobarometer special n°279 , Wave 67.1

Note: In view of the objective of the paper, each country, whether small or large, receives the same importance in the EU-27 averages; these averages are thus not computed on the basis of population weighted national results. As explained in Section 3.2, national samples are weighted to ensure national representativeness (in terms of gender, age…). For calculating the EU-27 averages, these weighted samples have been reweighted so as to achieve a sample size of 1000 for each country.

Table A1a: Proportion of individuals considering the items absolutely necessary – National results and EU-27 averages

Items	EU27	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SI	SK	UK
warm coat	66	71	61	84	67	63	68	65	73	88	59	73	66	77	64	56	46	79	61	32	45	68	71	80	71	63	77	58
two pairs of shoes	62	67	49	79	79	59	63	60	65	88	55	58	58	71	61	49	46	74	67	43	35	65	67	77	71	63	74	44
new clothes (adult)	35	36	14	49	67	21	21	14	31	75	38	23	25	44	45	21	27	36	45	37	11	40	39	63	27	33	53	22
smart clothes	29	40	16	38	44	26	14	9	34	43	30	33	15	37	43	12	20	16	50	33	15	34	23	54	20	18	56	23
meat, chicken or fish every 2nd day	43	36	47	54	29	22	29	37	44	53	58	46	41	39	57	44	32	35	52	39	35	47	76	62	39	30	38	36
fresh fruit/vegetables daily	50	47	43	58	61	27	44	35	40	74	61	38	41	54	58	44	34	52	50	50	41	49	78	66	41	59	57	50
buying medicine when needed	77	80	75	82	91	76	80	78	75	91	72	77	70	83	64	70	58	82	73	78	68	73	82	80	83	87	69	71
buying medical equipement	69	77	64	74	81	66	70	73	69	83	68	67	66	72	60	57	50	77	67	72	59	62	74	70	80	79	66	63
regular medical/dental check-ups	64	72	55	71	79	63	67	69	64	81	61	57	59	68	58	58	46	68	64	66	43	63	73	70	61	78	65	62
medical care when needed	79	84	76	83	92	79	83	85	81	92	73	80	72	85	63	68	60	80	75	81	78	76	82	78	87	85	78	78
one week holyday away from home	18	13	12	33	27	10	9	8	22	43	8	11	16	29	16	12	14	13	22	4	10	23	17	35	17	22	20	12
presents for family/friends	21	13	16	28	24	31	16	17	33	26	7	19	14	41	17	10	21	16	41	7	12	23	14	34	20	13	32	18
decorate home	14	11	10	21	9	11	11	6	30	16	7	9	8	21	18	9	12	10	16	4	7	29	16	22	5	12	24	13
going out once a month	14	11	9	26	21	11	6	4	19	29	8	10	8	20	14	9	13	14	27	10	4	14	13	27	6	10	21	10
inviting friends/family for dinner	13	10	8	27	17	8	8	8	17	22	9	9	9	24	14	10	13	10	21	5	9	20	13	23	9	8	16	10
regular leisure/sports activity	15	11	15	19	15	13	10	14	23	17	15	12	11	22	19	9	11	23	17	15	13	13	17	19	13	12	16	12
money on oneself	16	14	10	27	20	9	15	8	24	23	10	16	9	18	21	10	17	15	28	11	9	23	15	28	6	10	18	14
newspapers	16	12	9	30	14	13	15	7	23	19	8	14	7	27	18	10	17	15	29	12	9	19	14	29	13	13	28	8
holiday with parents (child)	28	22	17	48	32	28	17	22	33	50	18	21	33	44	16	19	25	25	41	7	18	39	25	42	25	37	27	23
space to study (child)	45	46	42	54	47	34	47	38	62	56	26	41	48	56	36	24	39	50	53	31	31	55	39	57	43	59	53	43
leisure equipment (child)	31	32	23	35	36	24	29	23	43	47	22	32	22	44	25	17	28	33	40	34	23	39	29	36	24	33	34	25
educational games (child)	41	41	37	46	58	35	45	22	54	62	31	31	35	56	36	27	36	47	53	49	34	44	35	54	26	39	41	45
three meals a day (child)	69	62	62	81	78	60	63	69	71	86	70	49	70	84	66	55	55	71	76	38	57	78	83	83	77	84	74	60
invite friends (child)	29	28	19	38	39	17	32	36	34	46	20	37	17	39	30	20	24	30	35	14	32	32	26	29	35	26	22	28
celebrations (child)	39	37	34	48	39	35	32	40	54	51	19	36	36	61	30	22	38	42	47	27	34	50	36	50	54	37	28	39
fresh fruit vegetables (child)	63	61	63	69	82	40	60	58	62	83	67	55	58	72	62	50	44	68	65	58	56	67	82	71	58	73	69	62
meat/chicken/fish once a day (child)	51	40	55	69	42	20	35	47	56	63	66	57	56	52	60	48	40	42	66	38	35	58	82	68	52	49	41	46
outdoor space (child)	53	54	60	50	54	46	58	45	64	66	40	62	58	61	53	29	41	65	67	39	57	57	45	52	53	54	52	53
new shoes (child)	63	67	58	66	83	52	69	64	71	79	50	56	68	74	62	42	45	79	71	49	44	67	57	72	63	65	63	63
new clothes (child)	50	53	33	56	82	30	42	47	58	78	47	38	39	67	55	24	37	54	67	45	27	53	53	71	50	53	50	47
regular leisure activity (child)	34	31	29	37	42	31	30	32	47	49	29	24	27	46	43	21	26	35	47	37	23	39	23	38	31	34	30	38
school trips (child)	36	42	27	38	49	24	46	52	44	54	24	28	23	45	33	20	28	32	44	27	33	39	28	40	48	43	32	28
pre-school education (child)	53	46	58	61	74	43	58	46	54	65	60	35	65	46	28	38	33	78	63	37	45	52	63	75	45	62	60	41
medical care (child)	83	87	79	85	95	85	86	89	83	94	75	83	82	87	64	70	62	91	81	85	82	78	85	87	92	91	84	80
meet expenses for education (child)	62	74	60	67	76	53	63	47	65	77	58	59	62	70	53	59	44	72	66	64	49	64	67	64	62	70	62	57
medicine and vitamines (child)	79	84	75	79	87	72	81	84	76	92	72	75	75	85	66	69	59	87	76	82	73	77	80	84	89	90	79	75
regular medical check-ups (child)	77	85	71	81	86	77	81	84	75	89	68	74	77	81	62	66	58	83	78	78	67	76	80	81	83	85	78	74

Source for data and Note: see above

Table A1b: Proportion of individuals considering the items absolutely necessary or necessary – National results and EU-27 averages

Items	EU27	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SI	SK	UK
rent/mortgage	97	98	97	97	99	96	93	97	98	98	98	98	97	98	99	97	98	96	98	97	97	95	100	99	98	95	95	97
utility bills	98	99	98	100	100	98	99	99	98	99	99	99	98	98	98	95	98	97	98	98	97	97	100	100	98	98	99	96
repay loans	91	92	90	95	97	91	83	83	97	93	97	96	90	97	94	94	95	89	96	90	63	92	92	97	94	93	89	87
unexpected expense	78	77	77	88	94	67	68	64	86	92	85	69	72	81	83	84	84	67	86	95	61	82	84	83	55	69	88	74
save each month	76	71	81	76	83	74	75	60	77	87	82	78	78	88	79	75	83	74	62	87	67	78	80	76	61	76	84	69
leave parents before 30	77	78	73	82	90	61	71	85	84	80	75	92	85	83	77	71	79	68	78	67	42	68	78	91	92	69	85	69
not too dark	87	89	79	97	96	83	78	71	94	97	86	83	76	95	91	84	91	84	90	93	69	89	97	93	69	89	95	82
no noise	76	76	58	92	88	68	60	51	85	89	82	74	68	84	83	67	83	68	83	91	56	78	90	88	60	67	88	73
no pollution	89	87	90	95	98	85	83	84	96	95	89	91	83	93	89	84	92	82	92	97	87	88	92	93	82	85	94	86
no crime	89	89	86	95	97	83	80	80	94	98	94	91	86	95	93	90	93	77	94	98	83	86	94	95	79	79	96	88
no leaking roof, damp walls/floors	97	97	97	99	98	97	97	96	99	99	98	98	97	75	98	94	97	93	98	98	96	98	97	98	97	98	98	98
keep home adequately warm	97	98	98	98	98	95	98	97	99	99	97	99	98	99	98	96	98	98	99	94	95	97	96	96	96	99	99	97
bath/shower	94	97	93	94	98	96	90	76	93	98	99	90	96	97	97	94	90	96	94	99	88	94	98	94	88	98	97	97
indoor flushing toilet	96	97	96	91	100	97	93	85	96	98	99	93	98	96	98	96	90	99	93	100	97	96	99	94	91	98	98	97
well maintained place	89	89	89	94	92	80	78	76	93	96	96	90	89	96	91	86	89	87	92	95	68	90	93	96	77	87	95	86
space to read/write, etc.	77	78	66	90	84	70	65	61	94	89	69	77	78	84	81	57	84	73	88	90	55	85	85	90	58	84	85	69
hot running water	95	98	95	87	99	95	92	88	91	98	99	96	98	96	96	94	87	97	90	99	94	94	98	97	91	97	98	96
well maintained public amenities	82	78	77	91	92	74	60	58	88	91	86	85	77	95	87	80	89	78	93	94	67	82	93	93	70	74	89	81
space to invite friends/family	69	65	55	84	86	51	55	56	73	82	65	64	66	80	77	57	78	66	81	72	45	74	82	83	52	64	73	64
no risk being forced to leave	93	93	93	96	97	92	84	84	98	97	98	96	93	98	97	93	94	93	95	98	82	95	95	99	79	94	96	93
mobile phone	51	33	30	68	74	51	20	38	79	60	43	59	26	58	50	43	66	46	77	75	14	48	67	73	34	49	73	23
colour TV	65	49	41	95	92	60	50	42	80	85	52	47	48	84	53	53	86	58	81	89	24	73	87	93	46	65	84	37
computer	38	19	26	51	49	27	20	36	59	32	31	32	26	36	32	27	47	40	49	72	24	44	43	60	33	40	56	21
internet connection	33	18	21	46	37	21	16	32	59	24	25	30	21	28	27	22	40	35	46	62	19	38	34	50	31	32	44	18
washing machine	90	92	81	96	99	95	89	59	93	95	97	86	87	97	88	87	90	95	89	97	83	95	96	90	77	98	99	83
car	56	36	47	69	99	44	36	27	61	84	58	39	74	42	60	66	57	66	52	85	19	47	67	63	41	74	67	31
refrigerator	97	96	94	99	100	96	96	94	98	99	98	97	97	98	94	92	96	97	97	100	87	97	99	98	97	98	99	92
cooker big enough	90	92	87	99	95	91	93	90	91	98	58	89	88	95	95	63	96	97	90	99	78	87	98	96	96	98	95	88
bed and bedding	98	96	97	99	100	98	97	96	98	99	94	98	98	97	98	94	97	100	99	100	97	96	99	97	97	98	99	97
repairing electrical goods	91	91	90	92	94	89	88	84	92	92	92	94	93	96	94	87	90	97	93	98	84	89	95	87	82	91	92	86
replacing worn out furniture	73	71	65	86	87	58	62	61	74	90	79	63	68	78	85	66	77	77	87	74	44	69	86	79	60	70	77	64

Source for data and Note: see above, Table A1a

Table A1b: Proportion of individuals considering the items absolutely necessary or necessary – National results and EU-27 averages

Items	EU27	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SI	SK	UK
warm coat	96	97	95	100	96	96	96	95	99	99	98	99	98	99	97	92	95	97	95	85	93	97	99	99	96	94	99	96
two pairs of shoes	95	96	89	98	99	93	95	93	98	98	96	97	94	97	93	90	94	97	97	97	79	97	98	98	97	93	99	88
new clothes (adult)	77	78	54	91	96	66	66	58	82	97	87	76	71	84	85	64	79	77	85	89	45	83	83	95	68	77	90	65
smart clothes	74	87	69	81	84	70	52	53	88	79	80	89	57	78	88	42	67	59	93	94	62	79	59	92	66	53	95	72
meat, chicken or fish every 2nd day	81	71	86	91	69	59	63	78	88	82	95	87	83	73	93	82	83	72	87	84	75	88	98	93	72	70	79	75
fresh fruit/vegetables daily	88	84	87	91	96	66	83	84	88	95	95	86	86	89	92	85	83	88	89	94	83	90	99	93	80	93	94	89
buying medicine when needed	98	99	98	99	99	99	98	99	99	99	99	99	98	98	97	95	98	98	98	99	98	98	99	99	99	99	98	98
buying medical equipement	97	98	96	98	99	96	96	98	98	97	99	98	97	98	96	93	95	98	97	99	97	95	99	96	98	98	96	96
regular medical/dental check-ups	95	98	92	98	98	95	94	96	97	96	97	95	93	95	94	92	95	96	96	98	88	95	98	95	94	98	97	95
medical care when needed	99	99	98	99	100	99	99	99	100	99	100	99	99	99	97	95	99	100	99	100	99	99	99	99	99	99	99	99
one week holyday away from home	49	33	37	77	72	36	26	30	64	80	44	38	53	64	50	35	47	43	60	30	33	55	61	74	47	54	59	40
presents for family/friends	63	50	51	76	79	73	50	66	86	69	38	64	58	83	55	38	76	62	89	65	45	64	52	80	58	49	80	56
decorate home	55	49	59	60	51	50	42	39	89	58	34	52	52	65	63	33	63	54	58	54	41	81	56	70	33	56	81	54
going out once a month	44	28	33	66	65	35	25	22	56	73	40	32	39	46	48	33	49	52	65	52	18	38	50	63	24	37	61	32
inviting friends/family for dinner	47	33	34	72	65	32	29	37	52	73	38	45	50	57	46	34	56	50	60	40	32	51	52	65	39	31	57	34
regular leisure/sports activity	54	40	58	53	59	44	41	55	75	58	63	53	54	55	60	36	47	69	51	69	52	41	56	53	50	50	62	43
money on oneself	53	49	40	73	71	32	48	41	72	74	49	62	46	50	66	34	64	48	68	62	40	61	47	70	25	38	60	44
newspapers	55	45	39	74	67	50	53	38	75	65	40	50	42	67	57	38	67	63	75	56	33	59	51	71	45	49	75	35
holiday with parents (child)	65	47	47	84	79	66	39	57	78	85	62	63	78	78	48	52	65	64	79	43	48	74	72	82	60	73	72	55
space to study (child)	91	93	89	95	96	86	92	90	98	93	78	94	93	93	86	70	95	91	96	96	84	95	90	95	91	95	96	89
leisure equipment (child)	80	82	74	79	85	74	76	81	93	88	69	90	77	87	70	61	83	85	86	91	76	81	76	83	78	79	87	68
educational games (child)	88	90	83	89	97	81	89	76	97	95	80	84	87	93	84	79	92	94	93	98	86	87	84	93	75	85	92	89
three meals a day (child)	96	93	94	98	99	92	92	98	98	99	98	90	98	99	94	91	97	97	99	85	93	99	99	99	98	99	98	92
invite friends (child)	76	71	66	84	93	56	77	90	85	89	54	92	63	80	76	61	76	77	81	65	79	73	76	78	83	67	75	73
celebrations (child)	84	83	78	88	88	77	74	88	95	91	64	87	83	94	77	69	92	85	90	84	85	89	83	91	93	77	76	81
fresh fruit vegetables (child)	95	94	94	95	98	83	93	94	96	98	95	95	94	97	96	90	92	96	95	98	94	97	99	96	90	97	97	95
meat/chicken/fish once a day (child)	85	75	90	95	78	56	66	84	93	83	96	93	91	82	95	84	89	81	94	85	73	94	99	96	83	82	81	81
outdoor space (child)	93	95	92	91	95	91	94	86	98	96	85	99	95	95	90	78	94	94	98	91	96	97	92	92	91	93	95	93
new shoes (child)	96	97	94	98	99	91	96	96	99	98	94	97	98	97	95	84	94	97	99	98	90	96	95	97	96	95	98	97
new clothes (child)	91	93	81	95	99	79	87	90	98	98	92	95	84	96	92	73	93	88	98	98	76	94	93	97	90	94	94	88
regular leisure activity (child)	83	80	79	81	88	77	77	86	93	91	78	79	83	90	88	69	82	85	92	97	72	83	78	85	76	79	85	86
school trips (child)	81	86	74	84	93	67	87	94	92	89	68	83	70	87	76	62	83	74	88	77	83	84	76	83	89	88	82	71
pre-school education (child)	88	79	91	93	95	83	89	84	92	93	93	84	94	84	68	82	87	97	94	89	82	90	94	98	82	90	94	76
medical care (child)	99	99	99	100	100	99	99	99	100	99	99	99	100	99	97	96	99	100	100	100	99	99	99	100	100	99	99	99
meet expenses for education (child)	96	99	96	97	100	95	95	89	97	98	97	98	97	96	95	95	95	98	98	99	90	97	95	95	95	97	98	94
medicine and vitamines (child)	99	100	98	99	99	97	99	99	99	99	99	99	98	98	97	96	99	99	100	100	98	99	99	99	100	99	99	98
regular medical check-ups (child)	99	99	97	100	100	98	98	99	99	99	99	99	99	98	97	96	99	98	100	100	97	99	99	98	98	99	99	98

Source for data and Note: see above, Table A1a

Table A2: Descriptive statistics - EU-27 averages

Variable	mean	variance	stdev	skewness	kurtosis
rent/mortgage	2,62	0,30	0,55	-1,20	4,08
utility bills	2,68	0,26	0,51	-1,30	4,05
repay loans	2,43	0,47	0,68	-1,02	3,71
unexpected expense	2,11	0,62	0,78	-0,45	2,45
save each month	2,14	0,78	0,88	-0,68	2,51
leave parents before 30	2,16	0,80	0,89	-0,74	2,56
not too dark	2,29	0,50	0,71	-0,60	2,59
no noise	2,07	0,60	0,77	-0,29	2,18
no pollution	2,36	0,46	0,68	-0,67	2,68
no crime	2,41	0,48	0,69	-0,86	2,93
no leaking roof, damp walls/floors	2,65	0,34	0,58	-1,76	6,59
keep home adequately warm	2,60	0,30	0,55	-0,96	3,07
bath/shower	2,57	0,37	0,61	-1,21	3,72
indoor flushing toilet	2,64	0,33	0,57	-1,47	4,70
well maintained place	2,32	0,46	0,68	-0,57	2,57
space to read/write, etc.	2,11	0,60	0,78	-0,36	2,22
hot running water	2,60	0,35	0,60	-1,28	3,96
well maintained public amenities	2,18	0,54	0,74	-0,45	2,45
space to invite friends/family	1,93	0,66	0,81	-0,17	2,13
no risk being forced to leave	2,52	0,40	0,63	-1,10	3,66
mobile phone	1,54	0,95	0,97	-0,01	2,00
colour TV	1,84	0,80	0,90	-0,28	2,23
Computer	1,29	0,86	0,93	0,28	2,23
internet connection	1,18	0,85	0,92	0,42	2,36
washing machine	2,43	0,49	0,70	-1,03	3,53
Car	1,68	0,90	0,95	-0,10	2,04
Refrigerator	2,61	0,32	0,56	-1,18	3,89
cooker big enough	2,42	0,47	0,69	-0,95	3,37
bed and bedding	2,69	0,27	0,52	-1,45	4,64
repairing electrical goods	2,34	0,43	0,66	-0,63	2,95
replacing worn out furniture	1,95	0,58	0,76	-0,18	2,36
warm coat	2,62	0,32	0,56	-1,27	4,09
two pairs of shoes	2,57	0,36	0,60	-1,19	3,91
new clothes (adult)	2,11	0,64	0,80	-0,47	2,42
smart clothes	2,00	0,66	0,81	-0,36	2,43
meat, chicken or fish every 2nd day	2,21	0,66	0,81	-0,71	2,69
fresh fruit/vegetables daily	2,38	0,50	0,70	-0,80	2,85
buying medicine when needed	2,75	0,23	0,48	-1,77	5,91
buying medical equipment when needed	2,66	0,29	0,54	-1,41	4,61
regular medical/dental check-ups	2,59	0,35	0,59	-1,23	3,97
medical care when needed	2,78	0,20	0,44	-1,82	5,75
one week holyday away from home	1,58	0,79	0,89	0,11	2,20
presents for family/friends	1,79	0,67	0,82	-0,12	2,33

decorate home	1,64	0,60	0,78	0,07	2,49
going out once a month	1,44	0,79	0,89	0,19	2,30
inviting friends/family for dinner	1,51	0,70	0,84	0,17	2,41
regular leisure/sports activity	1,61	0,70	0,83	0,03	2,38
money on oneself	1,62	0,70	0,83	0,07	2,34
newspapers	1,63	0,71	0,84	-0,01	2,35
holiday with parents (child)	1,88	0,75	0,87	-0,19	2,11
space to study (child)	2,35	0,42	0,65	-0,60	2,78
leisure equipment (child)	2,10	0,53	0,73	-0,34	2,48
educational games (child)	2,28	0,48	0,69	-0,60	2,82
three meals a day (child)	2,64	0,33	0,57	-1,51	4,98
invite friends (child)	2,02	0,60	0,78	-0,33	2,44
celebrations (child)	2,22	0,54	0,74	-0,54	2,59
fresh fruit vegetables (child)	2,58	0,36	0,60	-1,19	3,78
meat/chicken/fish once a day (child)	2,34	0,62	0,79	-0,98	3,22
outdoor space (child)	2,45	0,41	0,64	-0,86	3,17
new shoes (child)	2,58	0,34	0,58	-1,13	3,69
new clothes (child)	2,41	0,45	0,67	-0,81	3,04
regular leisure activity (child)	2,16	0,51	0,72	-0,41	2,55
school trips (child)	2,15	0,57	0,76	-0,48	2,53
pre-school education (child)	2,40	0,54	0,73	-1,01	3,37
medical care (child)	2,82	0,17	0,41	-2,18	7,47
meet expenses for education (child)	2,58	0,34	0,58	-1,15	3,92
medicine and vitamins (child)	2,77	0,20	0,45	-1,82	5,91
regular medical check-ups (child)	2,75	0,22	0,47	-1,75	5,75

Source for data and Note related to EU-27 averages: see above, Table A1a
Calculation of the mean: see Section 3.1

Table A3 (first part): Cluster analysis of the 68 items - EU-27*

N°	Item label	Cluster								
		1	2	3	4	5	6	7	8	9
Block 1 : Financial situation										
1	rent/mortgage payments on time	X								
2	pay utility bills (electricity...) on time	X								
3	repay loans (electrical appliances...)	X								
4	cope with unexpected financial expense	X								
5	save about each month	X								
6	no longer live with one's parents after 30	X								
Block 2 : Housing and local environment										
7	a place to live that is not too dark		X							
8	a place to live without too much noise		X							
9	a place to live without too much pollution		X							
10	a place to live without crime, violence		X							
11	a place to live without a leaking roof, damp walls...			X						
12	to keep one's home adequately warm			X						
13	a place to live with its own bath or shower			X						
14	an indoor flushing toilet for sole use of household			X						
15	a place to live that is well maintained state		X							
16	a place to live with enough space and privacy		X							
17	a place to live with hot running water			X						
18	a place to live with well maintained public amenities		X							
19	a place to live with enough space to invite friends/ family		X							
20	a place to live where one doesn't risk being forced to leave			X						
Block 3 : Housing durables and (tele-)communication										
22	a mobile phone				X					
23	a colour TV				X					
24	a computer				X					
25	an internet connection				X					
26	a washing machine					X				
27	a car				X					
28	a refrigerator					X				
29	a cooker big enough for the household					X				
30	a bed and bedding for everyone in the household					X				
31	repairing or replacing major electrical goods					X				
32	replacing worn out or broken furniture					X				

Source for data: European Commission, Eurobarometer special n°279 , Wave 67.1

X=item belongs to the cluster

*: EU-27 results presented in this Table are unweighted averages of unweighted national sample sizes

Table A3 (second part): Cluster analysis of the 68 items - EU-27*

Block 4 : Healthcare and other services, clothing and food										
33	a warm coat for the winter						X			
34	2 pairs of shoes suited to the climate						X			
35	some new, not second hand, clothes						X			
36	smart clothes for job interviews or other formal occasions						X			
37	a meal with meat, chicken or fish at least once every two days						X			
38	fresh fruit and vegetables once a day						X			
40	buying medicine when needed							X		
41	buying medical equipment (glasses, false teeth, etc.)							X		
42	regular medical and dental check-ups							X		
43	medical care when needed							X		
Block 5 : Social and leisure activities										
46	paying for one week annual holiday away from home								X	
47	buying presents for family or friends at least once a year								X	
48	being able to decorate one's home								X	
49	going out once a month (restaurant, cinema, disco or concert)								X	
50	inviting friends or family for dinner at home once a month								X	
51	participating in a regular leisure or sports activity								X	
52	spending a small amount of money each week on oneself								X	
53	buying newspapers, magazines and books								X	
Block 6 : Child										
54	a holiday with parents away from home one week a year								X	
55	enough space/privacy to study or do homework at home									X
56	leisure equipment (e.g. bicycle or other sport equipment)									X
57	educational games and children's books at home									X
58	3 meals a day						X			
59	being able to invite their friends home									X
60	celebrations on special occasions (birthday, Xmas...)									X
61	eat fresh fruit and vegetables once a day						X			
62	eat a meal with meat, chicken or fish at least once a day						X			
63	an outdoor space where they can play safely									X
64	new and properly fitting shoes						X			
65	some new and properly fitting clothes						X			
66	participating in a regular leisure activity									X
67	participating in school trips or children's camps									X
69	access to pre-school education before primary school							X		
70	medical care when needed							X		
72	to meet all the necessary expenses related to education							X		
73	getting medicine and vitamins when needed							X		
74	going for regular medical check-ups							X		
Number of items		6	8	6	5	6	11	9	9	8

Source for data: European Commission, Eurobarometer special n°279 , Wave 67.1

X=item belongs to the cluster

*: EU-27 results presented in this Table are unweighted averages of unweighted national sample sizes

Table A4: Level of consensus around the evaluation of necessities across the EU

clusters	Label	Proportion of necessary answers for each SCC					Consensus around necessary items for each SCC				Proportion of absolutely necessary or necessary answers for each SCC					Consensus around absolutely necessary items for each SCC			
		EU27	1	2	3	4	1	2	3	4	EU27	1	2	3	4	1	2	3	4
1 financial situation	rent/mortgage	97	98	98	97	97	1	1	1	1	65	73	68	64	63	1	1	1	1
	utility bills	98	99	99	98	98	1	1	1	1	70	78	76	68	67	1	1	1	1
	repay loans	91	93	92	91	91	1	1	1	1	53	63	54	53	49	1	1	1	4
	unexpected expense	78	94	84	77	74	1	1	1	1	35	55	41	34	29	3	2	2	2
	save each month	76	86	74	77	74	1	1	1	1	42	50	42	43	40	3	2	2	2
	leave parents before 30	77	79	80	72	78	1	1	1	1	44	47	45	38	48	2	2	2	2
2 local environment & general housing comfort	not too dark	87	95	93	87	83	1	1	1	1	43	61	53	43	36	3	3	2	2
	no noise	76	89	84	75	71	1	1	1	1	32	50	40	30	27	2	2	2	2
	no pollution	89	97	91	89	87	1	1	1	1	47	66	51	45	42	3	3	2	2
	no crime	89	98	93	89	86	1	1	1	1	53	70	58	49	48	1	1	4	4
	well maintained place	89	94	92	88	86	1	1	1	1	44	56	49	44	39	3	2	2	2
	space to read/write, etc.	77	88	84	75	74	1	1	1	1	35	45	40	35	31	2	2	2	2
	well maintained public amenities	82	92	88	82	78	1	1	1	1	37	48	43	38	31	2	2	2	2
	space to invite friends/family	69	80	75	65	66	1	1	1	1	27	33	32	27	25	2	2	2	2
3 basic housing comfort	no leaking roof, damp …	97	98	98	94	97	1	1	1	1	69	74	71	66	69	1	1	1	1
	keep home adequately warm	97	97	98	97	98	1	1	1	1	63	64	67	61	62	1	1	1	1
	bath/shower	94	98	97	95	92	1	1	1	1	64	81	68	65	57	1	1	1	1
	indoor flushing toilet	96	99	97	97	94	1	1	1	1	69	83	71	70	64	1	1	1	1
	hot running water	95	99	96	95	93	1	1	1	1	66	77	70	66	61	1	1	1	1
	no risk being forced to leave	93	97	95	94	91	1	1	1	1	59	65	60	62	55	1	1	1	1
4 (tele-) communication	mobile phone	51	70	63	51	42	1	1	1	4	19	33	25	18	15	2	2	2	2
	colour TV	65	89	75	64	56	1	1	1	1	26	45	30	25	21	2	2	2	2
	Computer	38	51	42	38	34	3	2	2	2	12	16	14	12	10	2	2	2	2
	internet connection	33	41	36	32	30	2	2	2	2	10	13	12	10	9	2	2	2	2
	Car	56	89	56	53	49	1	1	1	4	23	59	21	18	19	3	2	2	2
5 housing durables	washing machine	90	97	94	93	86	1	1	1	1	54	78	61	54	46	1	1	1	4
	Refrigerator	97	100	98	96	96	1	1	1	1	64	87	71	60	60	1	1	1	1
	cooker big enough	90	97	94	84	92	1	1	1	1	52	74	58	45	50	1	1	4	1
	bed and bedding	98	100	98	97	98	1	1	1	1	71	84	73	68	69	1	1	1	1
	repairing electrical goods	91	95	93	90	90	1	1	1	1	44	57	47	42	41	3	2	2	2
	replacing worn out furniture	73	84	80	69	70	1	1	1	1	25	37	31	22	21	2	2	2	2
6 clothing & food	warm coat	96	93	98	96	97	1	1	1	1	66	62	70	65	67	1	1	1	1
	two pairs of shoes	95	98	98	93	94	1	1	1	1	62	70	69	59	61	1	1	1	1
	new clothes	77	94	84	75	73	1	1	1	1	35	60	43	33	29	3	2	2	2
	smart clothes	74	86	84	71	69	1	1	1	1	29	40	42	28	23	2	2	2	2
	meat, chicken or fish every 2nd day	81	78	84	79	81	1	1	1	1	43	40	51	42	42	2	3	2	2
	fresh fruit/vegetables daily	88	95	92	87	87	1	1	1	1	50	62	58	49	45	1	1	4	4

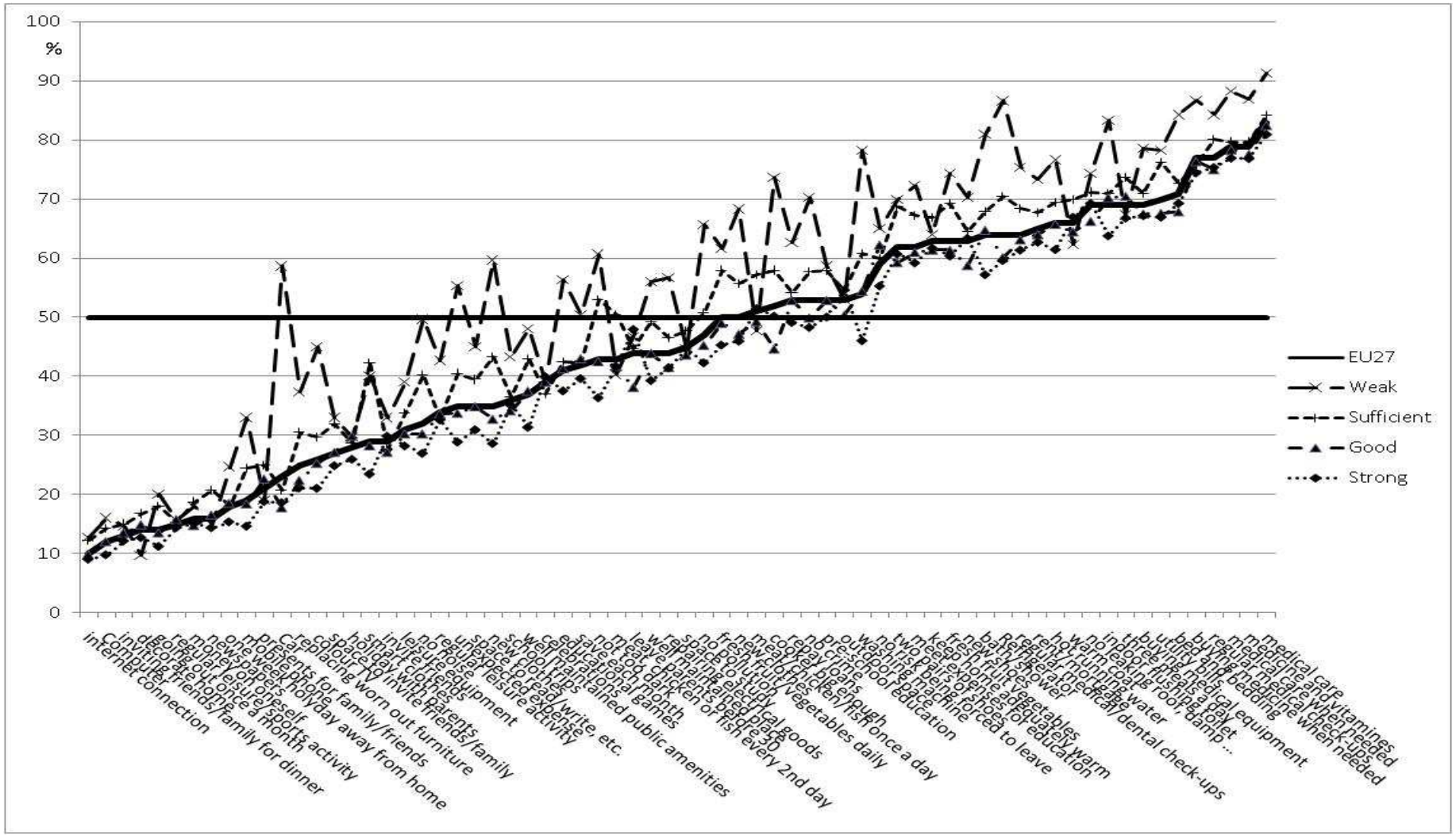
	three meals a day (child)	96	94	97	96	96	1	1	1	1	69	67	74	71	67	1	1	1	1
	fresh fruit vegetables (child)	95	98	96	94	94	1	1	1	1	63	74	69	61	60	1	1	1	1
	meat/chicken/fish once a day (child)	85	82	87	83	87	1	1	1	1	51	48	57	49	51	4	1	4	1
	new shoes (child)	96	98	97	93	96	1	1	1	1	63	70	65	59	63	1	1	1	1
	new clothes (child)	91	98	95	88	90	1	1	1	1	50	68	56	47	46	1	1	4	4
7 healthcare	buying medicine when needed	98	99	99	98	98	1	1	1	1	77	87	76	76	74	1	1	1	1
	buying medical equipment	97	98	98	97	97	1	1	1	1	69	79	71	68	67	1	1	1	1
	regular medical/dental check-ups	95	97	97	95	95	1	1	1	1	64	75	69	63	61	1	1	1	1
	medical care when needed	99	100	99	99	99	1	1	1	1	79	88	80	78	77	1	1	1	1
	pre-school education (child)	88	92	90	88	86	1	1	1	1	53	59	58	53	50	1	1	1	1
	medical care (child)	99	100	99	99	99	1	1	1	1	83	91	84	83	81	1	1	1	1
	meet expenses for education (child)	96	99	98	95	96	1	1	1	1	62	72	67	61	59	1	1	1	1
	medicine and vitamins (child)	99	99	100	98	99	1	1	1	1	79	87	80	78	77	1	1	1	1
	regular medical check-ups (child)	99	100	99	98	98	1	1	1	1	77	84	80	75	75	1	1	1	1
8 leisure & social activities (Adult)	one week holyday away from home	49	61	53	51	45	3	3	3	2	18	25	18	19	15	2	2	2	2
	presents for family/friends	63	71	68	62	61	1	1	1	1	21	19	25	23	19	2	2	2	2
	decorate home	55	54	61	55	54	1	1	1	1	14	10	17	15	13	2	2	2	2
	going out once a month	44	63	51	41	38	3	3	2	2	14	20	18	14	11	2	2	2	2
	inviting friends/family for dinner	47	59	51	43	45	3	3	2	2	13	15	15	14	12	2	2	2	2
	regular leisure/sports activity	54	62	52	54	52	1	1	1	1	15	16	15	16	14	2	2	2	2
	money on oneself	53	69	56	48	52	1	1	4	1	16	18	19	15	15	2	2	2	2
	newspapers	55	63	62	53	52	1	1	1	1	16	15	21	17	14	2	2	2	2
	holiday with parents (child)	65	69	68	67	61	1	1	1	1	28	30	29	30	26	2	2	2	2
9 leisure & social activities (children)	space to study (child)	91	95	94	87	92	1	1	1	1	45	45	48	44	45	2	2	2	2
	leisure equipment (child)	80	88	83	78	79	1	1	1	1	31	39	34	30	28	2	2	2	2
	educational games (child)	88	97	90	87	86	1	1	1	1	41	56	43	41	38	3	2	2	2
	invite friends (child)	76	82	76	70	78	1	1	1	1	29	33	28	27	30	2	2	2	2
	Celebrations (child)	84	88	83	82	85	1	1	1	1	39	39	37	39	40	2	2	2	2
	outdoor space (child)	93	94	95	91	93	1	1	1	1	53	53	55	50	55	1	1	1	1
	regular leisure activity (child)	83	92	84	80	82	1	1	1	1	34	43	33	34	33	2	2	2	2
	school trips (child)	81	86	83	79	81	1	1	1	1	36	43	37	34	35	2	2	2	2

Source for data: European Commission, Eurobarometer special n°279 , Wave 67.1

SCC: Structural Congruence Category (see Section 4.3);

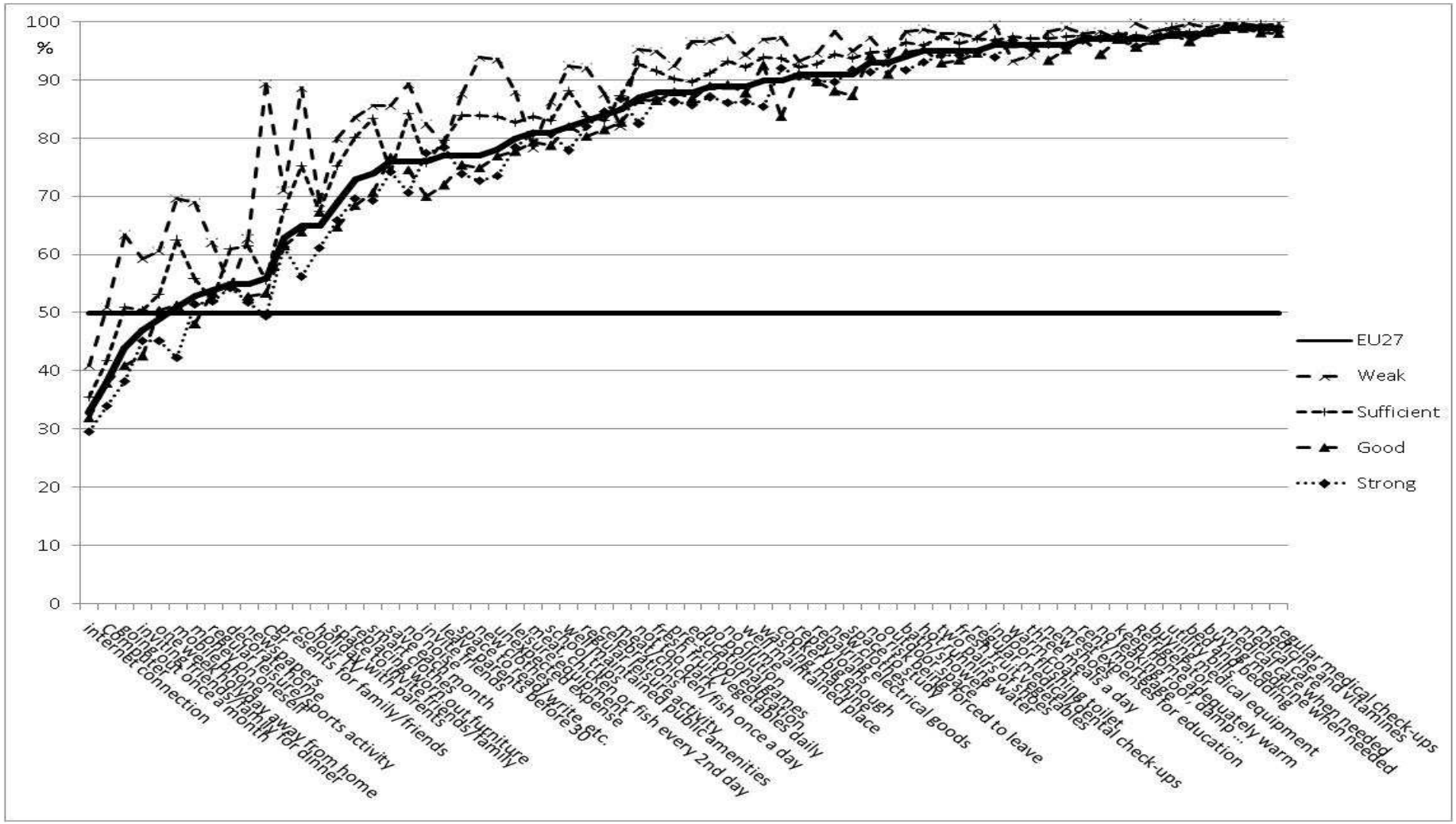
Level of consensus: 1=positive consensus; 2=negative consensus; 3=SCC preference; 4=EU-27 preference (see Table 4)

Figure A1: Proportion of Absolutely Necessary by SCC and EU27



Source for data: European Commission, Eurobarometer special n°279 , Wave 67.1
SCC: Structural Congruence Category (see Section 4.3)

Figure A2: Proportion of Absolutely Necessary or Necessary by SCC and EU27



Source for data: European Commission, Eurobarometer special n°279 , Wave 67.1

SCC: Structural Congruence Category (see Section 4.3)

Annex 3: Methodological Annex – MDS and INDSCAL

Annex 3: Methodological Annex – MDS and INDSCAL

Multidimensional scaling (MDS) is a class of multivariate models aimed at representing proximities between data in a reduced space. The contributions of Kruskal (1964), Guttman (1968), Lingoes (1972) and Shepard *et alii* (1972), have been instrumental for developing this method.

Presentation and discussion of mathematical aspects of MDS are beyond the scope of this paper. Information about the basic model and extensions, and some of its applications, can be found *inter alia* in the works of Kruskal and Wish (1978), Coxon (1982), Tournois and Dickes (1993) and Borg and Groenen (2005). Many similarities and differences exist between MDS and factor analysis, which have been analysed by McCallum (1974), Davison (1985) and Shye (1988). The advantages of MDS include: the compact representation of the objects, the possibility of testing the adequacy of the scaling, a fair dimensional and/or geometrical representation of the scaled objects, and also the possibility of measuring, at the same time, objects such as “individuals” or “groups of individuals” (in our paper, the individuals are the countries).

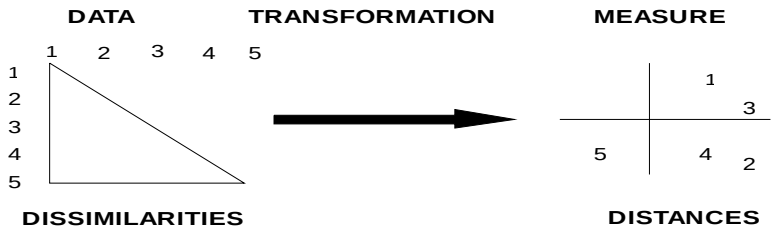
With a view to facilitating the interpretation of our results, some key features of MDS and Individual Differences Scaling (INDSCAL, an extension of MDS) are given in this appendix.

The application of the **basic MDS model** is governed by the following steps.

1) On the empirical side, data are proximities between objects forming a triangular data matrix (left side of Figure A3. These proximities can be obtained directly (for instance through experimental manipulation) or indirectly, by computation (such as correlation, standardised squared Euclidian distance, chi square or many other coefficients depending on the mathematical nature of the data). Proximities can also be expressed in terms of similarity or dissimilarity. For social scientists, there is a wide range of choices for applying MDS.

2) On the representational side, scaled objects are positioned in a space formed by 1, 2 or more other unknown dimensions (right side of Figure A3). In most cases, only a few dimensions are required for forming an adequate MDS space. The number of dimensions and the coordinates of the objects are unknown. The number of dimensions has to be chosen by the researcher and the coordinates must be estimated.

Figure A3. Schematic representation of the basic MDS model



3) Once the coordinates of the objects in the MDS space have been estimated, distances between the objects in this space can be computed. The distance matrix has a triangular form, similarly to the matrix of observed data.

4) There are many ways of linking the similarities (dissimilarities), on the empirical side, to the distances on the representational side. Ordinal transformation is preferred. The order of the dissimilarities of all pairs of objects must correspond as much as possible to the order of the distances of all pairs of points representing the objects.

5) The location of the points in the representational space is unknown and has to be estimated through iterative procedure. In a first step, one can assign the location at random in the representational space. It is thus possible to compute the distance matrix and compare this matrix with the observed proximity matrix. If the order of the dissimilarities corresponds to the order of the distances the solution is found. If this is not the case, then the position of the points in the representational space needs to be amended. The iterative procedure continues until the differences between the observed and obtained order cannot be further improved.

6) The differences between the observed and obtained order lead to the computation of an adequacy index called “stress” indicator. Different stress indicators have been proposed. In this research, we have used the Kruskal’s stress formula 1 which varies between 0 and 1. The lower the value of this index, the better the adequacy. The translation of the stress indicators in rsq (r square indicator) makes the interpretation easier.

INDSCAL (Individual differences Scaling), an extension of MDS, has enlarged the possibilities of applying MDS. Not only the measure of objects (items) is possible, but also the measures of individuals or group of individuals (in our paper, countries). The INDSCAL algorithm treats altogether items and individuals. It is also referred to as a weighted MDS and was formalised by Carroll and Chang (1970).

On the empirical side, dissimilarity matrices of all the objects are created for each individual (country). Then, in a first step a common space of the entire population is estimated and in a second step a weight matrix of the individuals is measured. The weight matrix reflects the distance between each individual solution and the common solution. Weights show the importance allocated to the dimensions of the common space in each dimension of the specific country solution.