Analysis of Social Participation: A Multidimensional Approach Based on the Theory of Partial Ordering

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1 Social Participation: Sense of Community and Well-Being

Historically, the surge of non-profit organizations is tied to the industrial revolution during the XIXth century and the social issues that it brought. A second wave of growth followed during the 1970s with the first reforms of modern welfare. Since then, the phenomenon of associationism covered an important role both in aggregating an atomized society and in integrating the deprived groups. From this point of view, participation itself is a process that leads to overcoming the isolation of individuals and groups (through aggregation processes) and the reduction of subordination through the distribution of power (through processes of equalization). Associations, made up of economic, cultural and social bonds not directly under the control of traditional organizations, also became a fundamental intermediary between citizens and public institutions, thus giving shape to what will be called civil society.

Today, non-profit institutions form a fabric of relationships and networks that underpins the political system and the state.

In the literature, it is widely recognized that such social fabric, a generalized climate of interpersonal trust, high involvement in associative networks and widespread civic culture, increases individual well-being and social cohesion, allowing a better performance, greater efficiency of public policies and a lower cost of economic transactions. In Italy, the formal networks, which include all the relationships that gravitate around individuals, are of particular interest: environmental association, cultural, recreational associations, volunteer groups or associations and political parties. These networks put in place human and material resources to

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provide support and protection to individuals both in everyday life and in critical moments and periods of discomfort, representing an essential element of social cohesion (Frisanco 2013).

According to the 2011 Census results, at the 31st of December 2011 Italian non-profit institutions were composed of a heterogeneous set of 301,191 private organizations that represented 6.4 % of the Italian labour market and employed 4.6 % of the paid workers (ISTAT 2014).

A modern definition of social participation should express a very broad concept. One accepted definition is the process of taking decisions concerning the life of an individual and that of the community in which he lives (Hart 1992). The participation is characterized by:

- An ongoing process of self-responsibility and choice;
- Being an interactive part of something, somewhere, some group.

Participating is a place of non-neutrality; it is the awareness that our being in the world is called to take an ethical line according to principles of justice and equity.

Studying this concept is really important because social participation, involving vulnerable and excluded groups, should seek the empowerment of those groups, increasing their effective control over decisions that influence their quality of life.

Because of the complexity of this concept, the study of social aspects increasingly requires the use of new tools that better render the reality and model the multidimensionality of the phenomenon. In this chapter, we will explore dynamic and multidimensional measures of social participation in Italy, leveraging properties of poset theory (Fattore and Arcagni 2013; Fattore 2015).

2 Why Partial Order Theory?

Previous analyses have focused on a particular aspect of social participation (e.g. political); instead, in this chapter we will explore dynamic and faceted aspects of social participation in Italy.

To obtain a synthetic representation of the forms of social participation, we adopt a fuzzy approach. Our purpose is not to give a measure of the phenomenon but to bring out its structure in terms of profiles. In this framework, a profile represents an aggregate of variables that identifies a ‘stereotypical individual’: we want to identify not only the socially active profiles, but also the borderline forms of participation highlighting the relationships and ranking of these stereotypes.

Because of the multidimensionality of the concept under examination, we cannot assert that there is any single expression of social participation, so we need to use a different language that better exposes the nuances and complexity of the phenomenon.

Furthermore, we need to consider that our data are categorical (nominal variables) with no single ordering between the categories. With this approach, the nature of the data is fully respected, avoiding any kind of scaling and aggregation procedure (Fattore et al. 2011). The adopted methodology will comprise the following steps:

- Selection of variables of interest;
- Casting data in the right mathematical form;
- Building the natural profiles poset;
- Adding relationships between profiles;
- Deciding which profiles have the minimum sets of characteristics to be considered socially active (threshold);
- Computing a ranking of profiles by 'linearizing' the poset;

While preserving the multidimensionality, we can infer a complete ordering of the profiles in the final step. This process is known as linear extension, it is a classical counting approach. We select all paths in the poset from top to bottom and count how many times a profile is above at least one of the threshold profiles. This number will generate an identification function that represents a ranking of all profiles.

The analysis was conducted using R and more specifically the package Parsec (Fattore and Arcagni 2014).

3 Official Statistics

The analysis uses the Multipurpose Survey on households: aspects of daily life, conducted by ISTAT. The population under survey comprises 59 million individuals, but after removing records with missing values it reduces to 51.716 million people aged 14 years and over (this is the effectively considered population).

Official statistics view the participation as taking part in collective actions and classify these actions in different categories. We have considered a subset of the survey, focusing on the four dimensions of social participation listed in Table 1.

Table 1 The dimensions of social participation

Selected variables	Dimensions
Meeting of cultural, recreational or other type of associations	Meeting
Meeting of political parties or trade unions	Meeting
Participation in political rallies or demonstrations/parades	Demonstration
Money given to associations or political parties/trade unions	Donation
Free-of-charge activity for volunteering groups or associations	Activity
Free-of-charge activity for political parties or trade unions	Activity

Selected variables are all binary and have all been modified to show the same polarity towards the participation level, recoded as 0 = not active, 1 = active

4 The Multidimensionality of Social Participation

Having 6 binary variables, our first step produces $2^6 = 64$ different possible profiles, all of which have been observed in our population. The best profile, P64, the most socially active, is a sequence of six 1 digits, while the worst profile, P01, the one that is not active in any of the selected categories, is a sequence of six 0s, as shown in the first Hasse diagram reported in Fig. 1. The first profile poset is composed by partially ordered profiles in a natural way and it represents the logical ordering (Fattore 2008; Fattore and Arcagni 2014).

Table 2 reports the frequency distribution of the generated profiles given by the statistical units belonging to it.

The basic structure is modified by adding relationships between profiles that we consider to be comparable in the specific research and by removing relationships that, while being present in the logical structure, do not have any meaning in the studied subject. Providing this information consists of adding new edges when the profiles are comparable and removing edges in the other case. Five order relationships have been added to our poset, while none have been removed:

- P05 < P17
- P05 < P33
- P13 < P17
- P13 < P33
- P09 < P17
- P09 < P33

Profiles P33 and P17 represent people who are volunteering in non-profit organizations or who are active in political parties or trade unions. We assume that these profiles are more engaged in social participation than profiles P05, P09 and P13. P05 represents people who participate in mass meetings and demonstrations, P09 represents people who donate money to associations or parties and P13 is

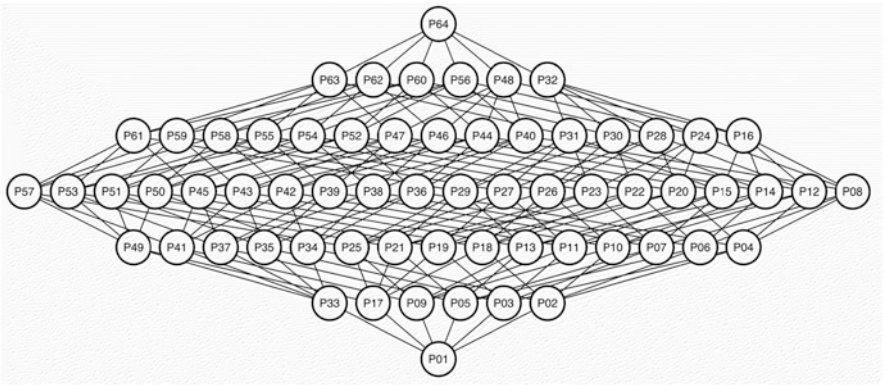

Fig. 1 Hasse diagram of the profiles poset

Table 2 Frequency distribution on elements of the profiles poset

Profiles	Weights[a]	Profiles	Weights[a]	Profiles	Weights[a]
P01	35.446	P23	4	P45	45
P02	1.029	P24	49	P46	19
P03	1.709	P25	8	P47	279
P04	234	P26	31	P48	154
P05	1.767	P27	1	P49	10
P06	506	P28	37	P50	7
P07	281	P29	8	P51	6
P08	140	P30	86	P52	17
P09	2.354	P31	2	P53	4
P10	320	P32	82	P54	7
P11	822	P33	905	P55	8
P12	184	P34	61	P56	25
P13	259	P35	1.339	P57	9
P14	158	P36	136	P58	5
P15	133	P37	97	P59	9
P16	150	P38	24	P60	69
P17	40	P39	174	P61	7
P18	87	P40	76	P62	28
P19	5	P41	306	P63	7
P20	20	P42	35	P64	221
P21	11	P43	1.315		
P22	88	P44	259		

[a]The frequencies of each profile are reported in million

the union of the preceding behaviours. Our assumptions are based on the effort and continuity of the commitment and the time spent on these actions. The new relationships give relevance to some profiles over others in the natural poset, relaxing its shape. The 'relaxed' Hasse diagram is shown in Fig. 2.

Once the structure has been defined, we need to identify a set of profiles that can be considered socially active. The minimal set of such profiles defines a threshold, such that any profiles below one of its elements is classified as not socially active. Imposing this threshold, we give 'social meaning' to the profile poset identifying two subsets, profiles above all the elements of the threshold, which are certainly active, and profiles below all the elements of the threshold, the non-active profiles (Fattore and Maggino 2014). An important feature of this kind of tool is that, besides obviously active profiles and non-active profiles, we also find the 'partially (or ambiguously) active participants' and we will be able to weight their 'activeness' once the poset is linearized.

The selected threshold is composed of the following profiles, highlighted in Fig. 3:

- P33—people belonging to this profile exclusively perform free-of-charge activity for volunteering groups or associations.

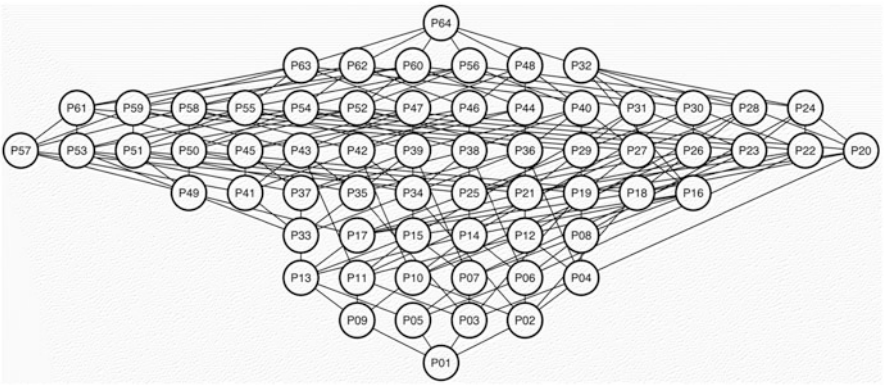

Fig. 2 Hasse diagram of the cover relation of poset

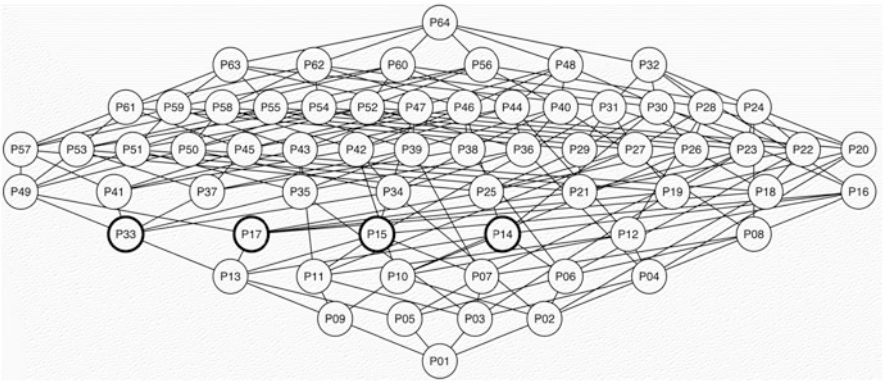

Fig. 3 The profiles poset highlighting the threshold: P33, P17, P15, P14

- P17—people belonging to this profile exclusively perform free-of-charge activity for political parties or trade unions.
- P15—people belonging to this profile participate in the meetings of associations, parades or political rallies and give donations to associations, parties or trade unions.
- P14—people belonging to this profile participate in the meetings of political parties or trade unions, parades or political rallies and give donations to associations, parties or trade unions.

Imposing new relationships and providing a threshold is a value judgement of the researcher. In the many-faceted participation concept, we have included in the threshold profiles that cut the poset across all dimensions. We have chosen instead to emphasize activism and direct participation to non-profit institutions over other forms of activities when we added the relationships. The choice of the threshold backs up the relevance of donations when paired with meetings, as forms of future planning, and parades/rallies.

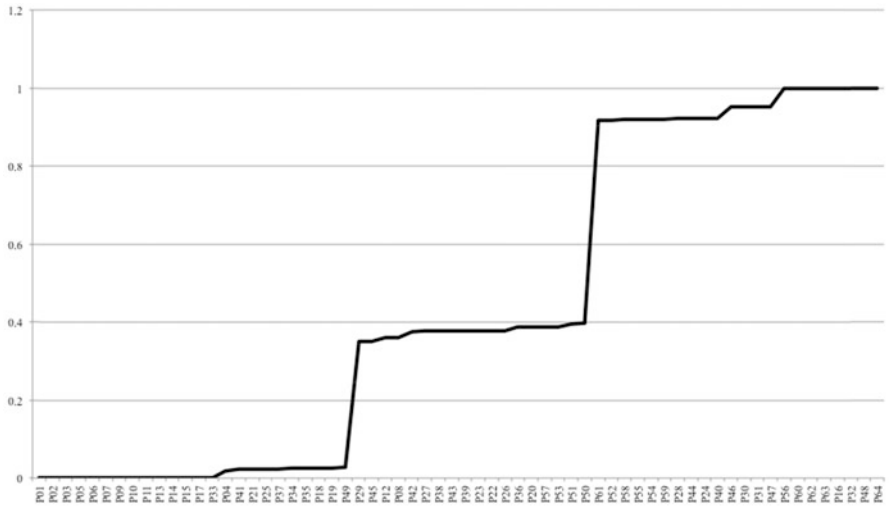

Fig. 4 Identification function

At the end of our analysis, we can calculate an indicator of the importance of each profile in terms of degree of participation. This indicator is the identification function (Fattore and Arcagni 2014). We can imagine identifying the n possible paths in the poset from profile P64 to profile P01 and unrolling the poset; this process is called linear extension. In each of these paths, a profile can be either above or below the threshold. Counting the number of times that a profile is above the threshold returns an indicator of how much a profile is socially active[1] (Fig. 4).

Profiles are sorted by their level of participation; on the Y-axis we can see their exact ranking, as calculated by the identification function. Notice that the ranking is not a binary condition (0 or 1), but a continuous value determined by the counting approach.

In Fig. 5, we combine the ranking with the weight of each profile.

We can identify three groups of profiles:

- Socially active profiles identified by an identification function value greater than 0.9;
- Partially active profiles with an identification function value between threshold profiles (in red in Fig. 5) and 0.8;
- Non-active profiles for which the identification function evaluates to zero and are not in the threshold set;

The analysis shows that only 14 % of Italians are active in at least some relevant way.

[1]The computations are based on a sample of linear extensions.

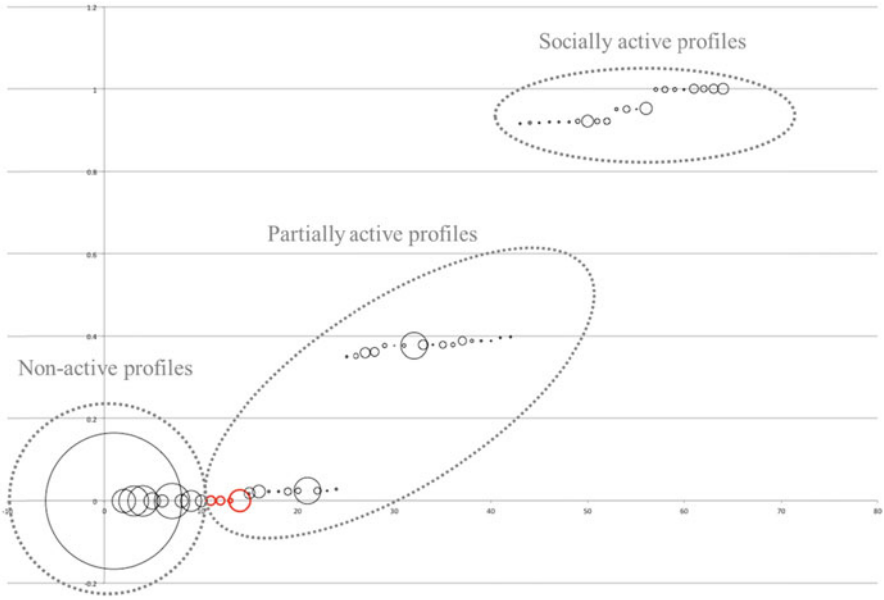

Fig. 5 Weighted profiles

The socially active profiles cover 3.1 % of Italians (nearly 1.6 million people); they are active in many dimensions. In this group, 3 profiles are of particular interest for their weight and manifold activity, all of them contain more than 200,000 units. Profile P44, while not taking part in parades/political rallies and activities for parties/trade unions, participates in the meetings of associations, political parties or trade unions and performs free-of-charge activity for volunteering groups or associations. Profile P47 represents the quintessential volunteer, unbound from the political dimension, in fact participates in the meetings of associations and demonstrations, gives money to non-profit institutions and performs free-of-charge activity for volunteering groups or associations. Profile P64 is the most active profile; in fact it represents the union of all possible activities being socially active in any dimension.

The partially active profiles are very differentiated and represent 10.9 % of Italians. The most significant profiles in terms of units are P12 and P43. The first one represents 184 thousand people who participate in meetings in associations or parties/trade unions and donate, while P43 is composed by 1.3 million people who attend meetings (associations, political parties/trade unions), donate and perform free-of-charge activities for associations.

The remaining 86 % of Italians are not socially active (more than 44 million people). The first profile, P01, includes people who responded ‘no’ to all questions and covers 35 million Italians, being the largest profile of the whole poset. The other profiles in this group describe people that mainly perform only one action that is by definition occasional compared with other kinds of activities (participating in political rallies or mass meetings and donations).

Analysing some characterizations of profiles, in particular gender, educational level, occupational status and territorial localization, we notice that, in general, men are slightly more participative than women: 15.9 % of men are above the threshold in contrast to 12.2 % of women. Furthermore, 72.5 % of women belong to profile P01, the totally inactive one, while only 64 % of men do not act in any way. Some different behaviours between genders arise: considering the most active profiles, men are more involved in activities tied to the political dimension (meetings, free-of-charge activities for political parties) coupled with participation in mass meetings and political rallies, while women are more interested in volunteering exclusively in non-profit institutions. Educational level has a big impact on participation: 27 % of people with a Ph.D. and 26 % of people with a bachelor's degree are very active in comparison with 5.5 % of people with only a basic education and 2.6 % without any educational level. Employed people belong to profiles that are more active (18 % belong to the high participative group) followed by students (17.9 %) and retired (12 %), mostly present in the partially active group. Housewives, people looking for their first job and people that are in other conditions come last, mostly belonging to the non-participative group. Housewives, in particular, are relevant in the profile of people who only give donations.

Finally, with regard to local distribution, the presence of active profiles is particularly prevalent in Northern Italy: North West contains 15.3 % of active profiles, North East 19.1 % while Islands and South Italy together contain only 20.1 %. The best performing territorial units are Bolzano 30.7 %, Trento 28.3 % and Veneto 20 %. The long tail of participation is closed by Campania, Calabria and Sicily.

5 Conclusions

Multidimensional social participation is a complex phenomenon. In this chapter, we have shown how poset theory provides an effective setting for fuzzy modelling of multidimensional categorical data as the subject under study. Interesting results come out from the analysis of the different profiles active in social participation. The poset methodology could represent the starting point to analyse in a different way the data about population. The poset could serve as a tool to guide the research in addition to obtaining a final output, for example research for further analysis about specific population subsets.

Subsequent experimentation and feedback from usage on more datasets, referring to different times and pertaining to different countries, could lead to improving the methodology, better refining the threshold and ordering relationships to obtain a more conformant model.

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